

**Descriptions and Evaluations of Existing California
Marine Protected Areas***
June 1, 2002

What is an MPA?

Below is a list of California's existing State-designated marine protected areas (MPAs). An MPA is defined as a named discrete geographic area that has been designated by law, administrative action, or voter initiative to protect or conserve marine life and habitat. MPAs are primarily intended to protect or conserve marine life and habitat, and are considered to be a subset of Marine Managed Areas (MMAs). The primary distinction between the two groups is that all MPAs have specific regulations restricting the harvest of all or some species which are more restrictive than the general fishery regulations.

By definition, marine protected areas include estuarine areas; areas where salt and freshwater meet such as the mouths of coastal rivers and lagoons. Within each region, MPAs are divided into "entirely marine" and estuarine MPAs. Entirely marine areas have the coastal shoreline as their terrestrial boundary or, in a few cases, have all boundaries in the ocean. Estuarine MPAs have one or more boundaries inland of the mouth of a bay or estuary. There are currently 52 California MPAs which are entirely marine and 18 MPAs which are estuarine.

How are MPAs evaluated?

The effectiveness of an MPA can be evaluated using a variety of criteria, including baseline monitoring studies, comparisons of factors such as species density, individual animal sizes, and the number of different types of marine species, the ability to provide research, educational, and non-extractive recreational opportunities, and the ability of the regulations to be enforced.

Each existing MPA has been evaluated, if possible, in order to determine its potential effectiveness and to provide information on its characteristics. A narrative version of each evaluation with appropriate literature citations follows. The literature cited includes those studies found to date and is intended to be an initial review. We expect to add citations as they are located. The literature citations are organized into four categories:

- 1) Published references which relate to the effectiveness of the particular MPA
- 2) Published references which relate to the use of the particular MPA as a site for

* Marine Protected Areas (MPAs) by definition have some restrictions on take of marine species. They are a subset of Marine Managed Areas (MMAs) which do not necessarily restrict take.

Department of Fish and Game
research

- 3) Unpublished references which relate to the effectiveness of the particular MPA; and
- 4) Unpublished references which relate to the use of the particular MPA as a site for research.

In some cases no references were found, these may be added later. However, the MLPA Planning Team recognizes the value of local knowledge as a relevant reference. In some cases no evaluations were possible due to a lack of information. This primarily applies to the estuarine sites.

The MPAs are organized geographically from north to south, by region, and by whether or not they are entirely marine. Four regions are used to geographically distinguish California MPAs:

North Region: Oregon border to Point Arena

North Central Region: Pt. Arena to Pt. Año Nuevo including the Farallon Islands

South Central Region: Pt. Año Nuevo to Pt. Conception

South Region: Pt. Conception to Mexico border including the offshore islands

At the end of this report is a general list of published and unpublished references that relate to MPAs, including some theoretical studies of MPA design where the work was not specifically conducted within or adjacent to existing MPAs.

Tables 1 and 2 list the names of existing California State-designated MPAs. They also list the new designation each area would receive under the Marine Managed Areas Improvement Act (Fish and Game Code Section 1591) if no changes are made to the existing regulations.

There are four categories of existing estuarine managed areas which are not included here: game refuges, waterfowl refuges, state estuaries and state wildlife areas. Existing regulations in these areas are the general fishery regulations and thus they are not formally considered Marine Protected Areas under the MLPA process. The estuarine areas which are considered as MPAs are presently classified as either ecological reserves or reserves. Some of these may have terrestrial or freshwater portions. The reclassification applies only to the portion below the mean high tide line.

Table 1. State-designated MPAs which are entirely in marine waters.

Existing MPA Name	New Designation Without Regulation Changes
North Region	
King Range Marine Resources Protection Act Ecological Reserve	King Range State Marine Reserve
MacKerricher State Park	MacKerricher State Marine Conservation Area
Point Cabrillo Reserve	Point Cabrillo State Marine Conservation Area
Russian Gulch State Park	Russian Gulch State Marine Conservation Area
Van Damme State Park	Van Damme State Marine Conservation Area
Manchester State Park	Manchester State Marine Conservation Area
Arena Rock Marine Natural Preserve	Arena Rock State Marine Conservation Area
North Central Region	
Del Mar Landing Ecological Reserve	Del Mar Landing State Marine Park
Salt Point State Park	Salt Point State Marine Conservation Area
Gerstle Cove Reserve	Gerstle Cove State Marine Conservation Area
Fort Ross State Historic Park	Fort Ross State Marine Conservation Area
Sonoma Coast State Beach	Sonoma Coast State Marine Conservation Area
Bodega Marine Life Refuge	Bodega State Marine Reserve
Pt. Reyes Headlands Reserve	Pt. Reyes Headlands State Marine Conservation Area
Duxbury Reef Reserve	Duxbury Reef State Marine Conservation Area
James V. Fitzgerald Marine Life Refuge	James V. Fitzgerald State Marine Conservation Area
South Central Region	
Hopkins Marine Life Refuge	Hopkins State Marine Reserve
Pacific Grove Marine Gardens Fish Refuge	Pacific Grove State Marine Conservation Area
Carmel Bay Ecological Reserve	Carmel Bay State Marine Conservation Area
Point Lobos Ecological Reserve and Point Lobos State Reserve (same boundaries)	Point Lobos State Marine Reserve
Julia Pfeiffer Burns State Park	Julia Pfeiffer Burns State Marine Conservation Area
Big Creek Marine Resources Protection Act Ecological Reserve	Big Creek State Marine Reserve
Atascadero Beach Pismo Clam Preserve	Atascadero Beach State Marine Conservation Area
Morro Beach Pismo Clam Preserve	Morro Beach State Marine Conservation Area
Pismo Invertebrate Reserve	Pismo State Marine Conservation Area
Pismo Clam Preserve	Pismo-Oceano State Marine Conservation Area
Vandenberg Marine Resources Protection Act Ecological Reserve	Vandenberg State Marine Reserve
South Region	
San Miguel Island Ecological Reserve	San Miguel Island State Marine Conservation Area
Anacapa Island Ecological Reserve	Anacapa Island State Marine Conservation Area
Anacapa Island Ecological Reserve Natural Area	Anacapa Island State Marine Reserve
Santa Barbara Island Ecological Reserve	Santa Barbara Island State Marine Conservation Area
Big Sycamore Canyon Marine Resources Protection Act Ecological Reserve	Big Sycamore State Marine Reserve

Department of Fish and Game

Existing MPA Name	New Designation Without Regulation Changes
Abalone Cove Ecological Reserve	Abalone Cove State Marine Park
Point Fermin Marine Life Refuge	Point Fermin State Marine Conservation Area
Catalina Marine Science Center Marine Life Refuge	Catalina Marine Science Center State Marine Reserve
Farnsworth Bank Ecological Reserve	Farnsworth Bank State Marine Conservation Area
Lovers Cove Reserve	Lovers Cove State Marine Conservation Area
Newport Beach Marine Life Refuge	Newport Beach State Marine Conservation Area
Crystal Cove State Park	Crystal Cove State Marine Conservation Area
Irvine Coast Marine Life Refuge	Irvine Coast State Marine Conservation Area
Laguna Beach Marine Life Refuge	Laguna Beach State Marine Conservation Area
Heisler Park Ecological Reserve	Heisler Park State Marine Reserve
South Laguna Beach Marine Life Refuge	South Laguna Beach State Marine Conservation Area
Niguel Marine Life Refuge	Niguel State Marine Conservation Area
Dana Point Marine Life Refuge	Dana Point State Marine Conservation Area
Doheny State Beach	Doheny State Marine Conservation Area
Doheny Beach Marine Life Refuge	Doheny Beach State Marine Conservation Area
City of Encinitas Marine Life Refuge	City of Encinitas State Marine Conservation Area
Cardiff and San Elijo State Beaches	Cardiff and San Elijo State Marine Conservation Area
San Diego Marine Life Refuge	San Diego State Marine Conservation Area
San Diego-La Jolla Ecological Reserve	San Diego-La Jolla State Marine Conservation Area
Point Loma Reserve	Point Loma State Marine Conservation Area

Department of Fish and Game

Table 2. State-designated MPAs which are entirely in estuarine waters.

Existing MPA Name	New Designation Without Regulation Changes
North Region	
None	
North Central Region	
Tomales Bay Ecological Reserve	Tomales Bay State Marine Park
Estero de Limantour Reserve	Estero de Limantour State Marine Reserve
Fagan Marsh Ecological Reserve	Fagan Marsh State Marine Park
Peytonia Slough Ecological Reserve	Peytonia Slough State Marine Park
Corte Madera Ecological Reserve	Corte Madera State Marine Park
Marin Islands Ecological Reserve	Marin Islands State Marine Park
Albany Mudflats Ecological Reserve	Albany Mudflats State Marine Park
Robert W. Crown Reserve	Robert W, Crown State Marine Conservation Area
Redwood Shores Ecological Reserve	Redwood Shores State Marine Park
Bair Island Ecological Reserve	Bair Island State Marine Park
South Central Region	
Elkhorn Slough Ecological Reserve	Elkhorn Slough State Marine Reserve
South Region	
Goleta Slough Ecological Reserve	Goleta Slough State Marine Park
Upper Newport Bay Ecological Reserve	Upper Newport Bay State Marine Park
Bolsa Chica Ecological Reserve	Bolsa Chica State Marine Park
Buena Vista Lagoon Ecological Reserve	Buena Vista Lagoon State Marine Park
Batiquitos Lagoon Ecological Reserve	Batiquitos Lagoon State Marine Park
San Dieguito Lagoon Ecological Reserve	San Dieguito Lagoon State Marine Park
San Elijo Lagoon Ecological Reserve	San Elijo Lagoon State Marine Park

North Region Marine Areas

Site name: King Range (Punta Gorda) Marine Resources Protection Act Ecological Reserve*

*As of January 1, 2002 the name of this site was officially changed by the Marine Managed Areas Improvement Act to: King Range State Marine Reserve

MLPA Region: North (Humboldt County)

Year established: 1994

Area: 1.97 nm²

Shoreline length: 1.74 nm

Depth range (feet): 18 to 180

Habitat types: Dominated by sand with some hard bottom; in a vigorous upwelling zone. Large wash rock (Gorda Rock) and a few subtidal pinnacles offshore.

Surrounding habitat types: Larger rocky habitat areas to the north of the reserve near Cape Mendocino. Mattole Submarine Canyon is 2 miles north of the reserve boundary. Spanish and Delgada Submarine Canyons are south of the reserve. Canyon habitats are rocky with soft substrate on their slopes.

Summary of existing regulations: No person shall fish within an MRPA ecological reserve, except as authorized pursuant to scientific research approved by the Department (Title 14, Section 630.5). No take; no disturbance of bottom; no boats, diving or other use (boat transit only); public entry restricted.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast; the King Range State Marine Reserve was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources".

Existing Enforcement: This area is too remote to monitor (20-30 mi. to nearest port). Access is very difficult and ocean conditions are unsuitable most of the time for at sea patrol. Patrol from shore is not possible due to lack of road access.

Baseline and ongoing monitoring and research studies:

Anonymous. 1979b California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report, King Range National Conservation Area. California State

Department of Fish and Game

Water Resources Control Board, Division of Planning and Research, Surveillance and Monitoring Section. Water Quality Monitoring Report No. 79-18

Karpov, K.A., et al. (In Prep.) Quantitative inventory of habitat and species of management importance at Punta Gorda Ecological Reserve. MERRP Sea Grant Report. Proj. PG-1, Marine Eco. Reser. Res. Prog.

Basic Evaluation: The reserve currently protects a small amount of rocky habitat which is unique in its encrusting invertebrate assemblage. Suitable habitat for nearshore finfish species of management concern is sparse within the reserve. The reserve also has low algal abundance due to high turbidity and sand scour. Karpov et al. (in prep.) observed no red abalone within the reserve and very few red sea urchins. This report also recommended relocation of the reserve to an area with habitats more suitable for species of management concern, and to allow better access to the reserve for research and enforcement.

Published references related to effectiveness of this MPA;

Karpov, et al. (In Prep.)

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

Karpov, et al. (In Prep.) .

Unpublished references related to use of this MPA as a research tool;

None found.

Department of Fish and Game

Site name: MacKerricher State Park

MLPA Region: North (Mendocino County)

Year established: 1970

Area: 0.54 nm²

Shoreline length: 3.30 nm

Depth range (feet): 0 to 18.

Habitat types: Exposed sand and impacted hard bottom habitat. Significant reef structure throughout the reserve at Laguna Point. Offshore habitat includes sand and hard bottom substrate. Primary habitats are sand beach, rocky intertidal, headland, kelp bed.

Surrounding habitat types: Extensive sandy areas to the north of park; to the south there is extensive hard bottom rocky reef beyond one mile from shore. Directly offshore, the substrate is hard bottom with high vertical relief (> 10ft).

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: This site met the criteria for State Park-Underwater Park established by the California State Parks and Recreation Commission in the Underwater Parks Master Plan. Underwater parks consist of relatively spacious areas of outstanding scenic or natural character, containing significant historical, archaeological, ecological, or

Department of Fish and Game

other features. The purpose of an underwater park is to preserve these natural, scenic, and cultural values, and to perpetuate them as outstanding examples of California's underwater environment and history. These criteria also include an area's proximity to an established terrestrial park.

In the Department of Parks and Recreation's (DPR) general plan for MacKerricher State Park, the stated purpose of this site is "to make available to the people for their inspiration, enlightenment, and enjoyment, in an essentially natural condition, the outstanding scenic features and natural values, including offshore marine environs and submerged lands..."

A stated goal is "to identify, protect, and perpetuate the diversity of existing ecosystems which are found at Manchester State Park, and are representative of California's seacoast."

A stated objective is "to identify and protect...sensitive natural resources found in the park."

Existing Enforcement: The area is currently patrolled by DPR rangers and DFG wardens.

Baseline and ongoing monitoring and research studies: The State Department of Parks and Recreation Parks (DPR) periodically conducts underwater biotic inventories of its underwater park units and accompanying species lists are available (DeMartini 1991). In response to the Marine Life Protection Act and the Marine Managed Areas Improvement Act DPR is currently reviewing and evaluating State Parks, Underwater Parks, and Reserves. High resolution digital elevation model (DEM) bathymetry mapping was completed in 2001 from Noyo Harbor to Laguna Point out to one mile by a CDF&G contract with California State University at Monterey Bay. Baseline fish and invertebrate surveys were started by CDF&G in 2001 using an ROV (20 B 50 m depth).

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. However, the area does function well by providing opportunities for recreation and scientific research. MacKerricher State Park is just to the north of the city of Fort Bragg and is a popular destination for recreational abalone "shore-pickers" and divers. The open-ocean exposure of the park is unsafe for launching watercraft, thus recreational fishing is restricted to the shoreline. The intertidal zone at Laguna Point on the north end of the park is commonly used for research and educational activities and is the site of a large haul out and pupping area for harbor seals. Red sea urchins and nearshore finfish are harvested commercially along the southern portion of the park. Personnel at the Russian Gulch District Office of State Parks and Fort Bragg Fish and Game Office believe this site is a good candidate for a State Marine Reserve. The area is small, has limited public access to the water, and has on-site enforcement personnel. There is also good historical baseline data on invertebrate populations. Due to the proximity to Fort Bragg, the approximate present boundaries could be retained to allow the protection of the shallow nearshore area without impacting offshore

Department of Fish and Game

fishing. Some recreational abalone hunters and commercial urchin fishermen have requested that if increased protection is given to this area, it be designated a State Marine Conservation area to allow both activities to continue.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

DeMartini, J.D. 1991; Kalvass, P., et al. 1991; Karpov, KA. 1988

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Pt. Cabrillo Reserve

MLPA Region: North (Mendocino County)

Year established: 1975

Area: 0.07 nm²

Shoreline length: 0.35 nm

Depth range (feet): 0 to 180

Habitat types: Headlands and protected coves with sand beaches. Habitats include rocky intertidal, sand beaches, kelp beds, and coastal tributaries. Offshore habitat consists of soft and hard bottom substrate.

Surrounding Habitat types: Adjacent nearshore habitat is similar to that within the reserve.

Summary of existing regulations:

Recreational: No form of marine life may be taken in these waters. (Title 14, Section 27.45)
Marine aquatic plants may not be cut or harvested in marine reserves. (Title 14, Section 30.00)

Commercial: To 1,000 feet offshore, no mollusks, crustaceans, or other invertebrates may be taken. (Title 14, Section 123 (f)(2)(B))

Primary objectives: No legally mandated mission accompanies the Reserve classification. Each reserve was created on a case-by-case basis. Since these areas were established by the Fish and Game Commission, the authority to restrict collection or harvest of finfish does not pertain to commercial fishing. Some reserves prohibit the recreational collection or harvest of all forms of marine life, others prohibit the collection or harvest of all invertebrates and/or plants only, and one allows the collection or harvest of specified fishes and invertebrates.

Existing Enforcement: The shoreline is monitored by DPR rangers and DFG wardens.

Baseline and ongoing monitoring and research studies: State Parks baseline evaluations available. High resolution digital elevation model (DEM) bathymetry mapping was completed in 2001 from Russian Gulch to Jughandle Point out to one mile by a CDF&G contract with CSUMB. Baseline fish and invertebrate surveys were started by CDF&G in 2000 and 2001 using an ROV (20 B 80 m depth).

Basic Evaluation: Pt. Cabrillo Reserve is a key site for Department red sea urchin,

Department of Fish and Game

Strongylocentrotus franciscanus, and red abalone, *Haliotis rufescens*, dive surveys. Data from dive surveys at the site have resulted in several publications which have contributed to the management of abalone and urchin. The hard bottom areas in this reserve have been extensively mapped, and contain complex, high relief habitat for nearshore fish and invertebrates representative of the surrounding areas. Surveys have indicated that red urchin abundance is greater within the reserve than in adjacent fished areas. This reserve is one of the unusual protected areas that are currently closed to recreational fishing but open to commercial fishing for finfish. The area could be designated as a State Marine Reserve and could form the no-take core of a larger marine protected area. A boundary out to one mile would greatly increase the amount of high-quality fish habitat within the reserve, and an extension north to 39° 22' would encompass Pygmy Forest Ecological Staircase Area of Special Biological Significance. Opposition has been expressed to a northern boundary extension that would encompass Casper Cove, a popular launching point for recreational skiffs, and the suggestion has been made to make any shoreline extension to the south (rather than to the north) which contains similar habitat to the reserve.

Published references related to effectiveness of this MPA:

Karpov K.A., et al. 2001.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

Anonymous. 1981; Giorgi, A.E. and J.D. DeMartini. 1977; Kalvass, P., et al. 1991; Kalvass, P., et al. 1990; Karpov, et al. 2001; Karpov, et al. 1998; Karpov, K.A. 1988

Unpublished references related to use of this MPA as a research tool:

None found.

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Site name: Russian Gulch State Park

MLPA Region: North (Mendocino County)

Year established: 1970

Area: 0.06 nm²

Shoreline length: 1.82 nm

Depth range (feet): 0 to 18

Habitat types: Headlands and protected coves with sand beaches. Offshore substrate consists of a mix of soft and hard bottom. Habitat includes kelp beds, surf grass, sand beaches, and rocky intertidal.

Surrounding habitat types: Similar intertidal and subtidal habitats and small sand beaches are found to the north and south. To the south are the Mendocino Headlands and large rock islands. Pt. Cabrillo Reserve is located approximately four miles to the north.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: This site met the criteria for State Park-Underwater Park established by the California State Parks and Recreation Commission. These criteria include marine area natural, recreational, cultural, and scenic underwater resources, as well as its proximity to an established terrestrial park.

Existing enforcement: This area is regularly patrolled by DPR rangers and DFG wardens.

Baseline and ongoing monitoring and research studies: DPR periodically conducts underwater biotic inventories of its underwater park units and accompanying species lists are available (DeMartini, 1990). In response to the Marine Life Protection Act and the Marine Managed Areas Improvement Act, DPR is currently reviewing and evaluating State Park Underwater Parks and Reserves.

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. However, the area does function well by providing recreational opportunities. Due to the close proximity of this park to the towns of Fort Bragg and Mendocino and its high scenic value, Russian Gulch is a highly used State Park. This area offers shoreline entry for beginning to advanced divers, and small skiffs can be launched from the park's sheltered cove for access to nearby reefs for recreational abalone diving and fishing. This area is also easily accessed by commercial fishermen and sea urchin divers from the nearby fishing ports of Albion and Fort Bragg. The boundaries of the existing State Park could be altered to allow a small increase in the size of the MPA in order to improve public recognition of the boundaries, and to simplify enforcement. Changing the classification of this area to Marine Park (restricting commercial fishing) would lessen the overall fishing pressure on nearshore finfish species within the MPA boundaries and reduce the chance of user conflicts within this relatively small MPA.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

DeMartini, J.D. 1990

Unpublished references related to use of this MPA as a research tool:

None found.

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Site name: Van Damme State Park

MLPA Region: North (Mendocino County)

Year established: 1970

Area: 0.02 nm²

Shoreline length: 0.26 nm

Depth range (feet): 0 to 18

Habitat types: Headlands and protected coves with sand and cobble beaches. Offshore substrate consists of rock reefs and sand bottom. Habitats include kelp beds, sand beaches, cobble beaches, rocky intertidal, and a coastal tributary.

Surrounding habitat types: Headlands with small pockets of sand beaches to the north and south of this area with intertidal and subtidal substrate composed of mixed hard and soft bottom.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: This site met the criteria for State Park- Underwater Park established by the California State Parks and Recreation Commission. These criteria include marine area natural, recreational, cultural, and scenic underwater resources, as well as its proximity to an established terrestrial park. The Department of Parks and

Department of Fish and Game

Recreation's General Plan of 1994 states "Underwater resources offshore at Van Damme State Park are of statewide significance including diverse habitats associated with tidepools, numerous rock sea stacks, and diverse underwater topography. Biologically this area is valuable due to the diversity of habitats and marine invertebrates."

Existing enforcement: The area is currently patrolled by DPR rangers and DFG wardens.

Baseline and ongoing monitoring and research studies: DPR periodically conducts underwater biotic inventories of its underwater park units and accompanying species lists are available (DeMartini1990). In response to the Marine Life Protection Act and the Marine Managed Areas Improvement Act, DPR is currently reviewing and evaluating State Park Underwater Parks and Reserves. This park has been the site of several baseline and ongoing studies conducted by The Department throughout the years, most notably red sea urchin, *Strongylocentrotus franciscanus*, red abalone, *Haliotis rufescens* and bull kelp, *Nereroecystis luetkeana*.

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. However, Van Damme State Park is a highly used marine area providing recreation, education, and research opportunities. Several shallow- water reefs are easily accessible either by swimming from shore or using small watercraft, which can be easily launched from Van Damme beach. This park is one of the most popular destinations in the state for recreational abalone diving and is often the site of dive-club organized spearfishing competitions. This area is also easily accessed by commercial fishermen and sea urchin divers from the nearby fishing ports of Albion and Fort Bragg. The boundaries of the existing State Park are currently difficult to recognize and could be altered to allow a small increase in the size of the MPA in order to improve public recognition of the boundaries and to simplify enforcement. Changing the classification of this area to Marine Park (restricting commercial fishing) would lessen the overall fishing pressure on nearshore finfish species within the MPA boundaries and reduce the chance of user conflicts within this relatively small MPA.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

Collier, K., et al. 1984; DeMartini, J.D., et al. ; Giorgi, A.E. and J.D. DeMartini. 1977; Kalvass, P., et al. 1991; Kalvass, P., et al. 1990; Kalvass, P. 1989; Karpov, et al. 2001; Karpov, et al. 1998. Karpov, KA. 1988

Department of Fish and Game

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Manchester State Park.

MLPA Region: North (Mendocino County)

Year established: 1970

Area: 3.95 nm²

Shoreline length: 3.23 nm

Depth range (feet): 0 to 125

Habitat types: Sandy bottom dominates with outcroppings of rocky pinnacles.

Surrounding habitat types: This coastline is notable for its unique geomorphology. The San Andreas Fault re-enters the ocean at the mouth of Alder Creek at the northern boundary of Manchester Underwater Park. The coastline above this point is characterized steep headlands with accompanying narrow bands of rocky intertidal, a subtidal substrate of mixed soft and hard bottom, and numerous nearshore rock islands. Coastal streams have cut through the marine terrace at various points creating wetland and riparian habitat and pockets of sandy beaches. Directly to the south at Arena Cove and Mote Creek are highly productive intertidal reefs composed of sedimentary rock. Large portions of sand beach are also found in this area. Offshore of Iversen Point, approximately 10 miles south of Point Arena, is Saunders Reef which contains one of the largest stands of bull kelp, *Nerocystis luetkeana*, along the north coast.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park

Department of Fish and Game

designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives for establishment of site: State parks are designated to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of such ecological regions. (Public Resources Code 5019.53 and Title 14, Section 4752)

Existing enforcement: The Department of Parks and Recreation works in cooperation with the Department of Fish and Game, assimilating its regulations in the state park system.

Baseline and ongoing monitoring and research studies: The State Parks System conducts periodic resource evaluations.

Basic Evaluation: Manchester State Park subtidal habitat consists of primarily sandy bottom, with the exception of the Arena Rock Marine Natural Preserve, which is within the park boundary, detailed below. The primary objective in establishing this site as a state park was to preserve a significant example of the geomorphology within this ecological region. This goal, separate from any biological goal, is met under the current designation. Enforcement in this region is generally difficult due to the remoteness of the site but can be accomplished with the Department's long-range patrol vessels. Manchester State Park would benefit from being designated as a State Marine Park, and Arena Rock Marine Natural Preserve could be re-designated as a State Marine Reserve to allow for greater ecological representation and protection (see Arena Rock Natural Preserve below).

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Arena Rock Marine Natural Preserve

Note: Arena Rock Natural Preserve is a subunit within Manchester State Park

MLPA Region: North (Mendocino County)

Year established: 1987

Area: 0.59 nm²

Shoreline length: not applicable

Depth range (feet): 0 to 168

Habitat types: The site is primarily a large rock pinnacle, with exposed wash rock and sandy bottom.

Surrounding habitat types: Sandy bottom is dominant, with some rocky outcrops.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: State natural preserves consist of distinct areas of outstanding natural or scientific significance already within the boundaries of other park system units. Natural preserves are designed to preserve such features as rare or endangered plant and animal species and their supporting ecosystems, representative examples of plant or animal communities existing in California prior to the impact of civilization, geological features illustrative of geological processes, significant fossil occurrences or geological

Department of Fish and Game

features of cultural or economic interest, and topographic features illustrative of representative or unique biogeographical patterns (Public Resources Code 5019.71 and Title 14, Section 4759). A stated objective in The Department of Parks and Recreation's general plan is "to retain natural preserve status for Arena Rock...".

Existing Enforcement: Arena Rock Marine Natural Reserve falls within the boundaries of Manchester State Park. The Department of Parks and Recreation works in cooperation with the Department of Fish and Game, assimilating its regulations in the state park system.

Baseline and ongoing monitoring and research studies: No quantitative studies have been conducted at Arena Rock Natural Preserve. A Dept. of Parks and Recreation dive team and the California Underwater Parks and Preserves Advisory Board have conducted investigative dives here starting in 1973. Qualitative baseline studies exist in park surveys conducted between Pt. Arena and Arena Cove.

Basic Evaluation: This area currently provides limited protection for the invertebrate species that inhabit the offshore rocks and pinnacles, however there is no study reporting the efficacy of the reserve. Enforcement of the preserve boundaries is difficult given the relatively small size and location offshore. It is possible that enforcement would be easier given a larger preserve size (violation of boundary would be more obvious), and ecological representation of subtidal habitat would be enhanced by the inclusion of rocky outcroppings and sandy areas between Arena Rock and Pt. Arena.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

North Central Marine Areas

Site name: Del Mar Landing Ecological Reserve

MLPA Region: North Central (Sonoma County)

Year established: 1972

Area: 0.06 nm² **Shoreline length:** 0.6 nm

Depth range (feet): 0 to 42

Habitat types: Primarily rocky subtidal habitat

Surrounding habitat types: To the north, south, and offshore are rocky subtidal habitat, and some sandy areas.

Summary of existing regulations: Prohibited take of all commercial species and all recreational invertebrates and marine aquatic plants. Recreational finfish fishing allowed. (Title 14, Sections 630.0, 630.0 (b)(5))

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Enforcement is difficult due to the remoteness of the area.

Baseline and ongoing monitoring and research studies: No baseline or ongoing monitoring or research has occurred or does occur.

Basic Evaluation: Thus far, very little study specific to the efficacy of this area as a marine protected area has been pursued. However, this is an area where the degree of protection could be increased and site boundaries could be expanded with little opposition from consumptive groups. The community is very supportive of a state marine reserve in this area and would contribute to the effectiveness of local enforcement.

Published references related to effectiveness of this MPA;
None found.

Department of Fish and Game

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Salt Point State Park

MLPA Region: North Central (Sonoma County)

Year established: 1970

Area: 1.24 nm² **Shoreline length:** 3.5 nm

Depth range (feet): 0 - 222

Habitat types: The area contains exposed and sheltered coastline with mostly hard bottom, and includes numerous wash rocks and rock shelves interspersed with gravel/sandy bottom. The substrate is primarily Franciscan sandstone and shale parent rock.

Surrounding habitat types: The surrounding area contains primarily gravel/sandy bottom with rocky outcroppings.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: State parks are designated to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of such ecological regions (Public Resources Code 5019.53 and Title 14, Section 4752, CCR). The Department of Parks and Recreation's General Plan states

Department of Fish and Game

“the primary purpose of Salt Point State Park is to preserve the outstanding scenic, scientific, natural, and cultural values found on the Sonoma Coast, including offshore areas...”.

Existing enforcement: Long-term cooperative enforcement between State Park Rangers, State Fish and Game Wardens and Sonoma County Sheriff Deputies.

Baseline and ongoing monitoring and research studies: No quantitative studies have been conducted at Salt Point. State Park System Dive Team and the California Underwater Parks and Preserves Advisory Board have conducted numerous dives here starting in the late 1960s. Seldenrich and DeMartini (1979) reported on interpretation and management of Mendocino Headlands and Salt Point State Underwater Parks. They described the biota of various depths and physical environments. This report can be considered a qualitative baseline.

Basic Evaluation: Salt Point State Park is a highly utilized recreational and commercial fishing area. Due to the number of people frequenting the area that are aware of the limited restrictions currently in place, the park functions to the extent of those regulations. Anecdotal references to increased numbers and size of individual species have varied from year to year, but in general speak to a positive effect relative to areas outside the park. Commercial Passenger Fishing Vessels commonly anchor in this park, shore-based anglers frequent the access points, and commercial urchin fishing activity also occurs in this area. Rocky habitat, wash rocks and similar habitat lay both north and south of the current park boundaries. Expansion of the park would provide for larger scale representation of this habitat but would meet with considerable opposition from both commercial and recreational consumptive users.

Published references related to effectiveness of this MPA;

Rogers-Bennett, L. and J.S. Pearse. 2001

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

Morgan, L.E., et al. 2000(1); Morgan, L.E., et al. 2000(2); Smith, B.D., et al. 1998; Wing, S.R., et al. 1995(1); Wing, S.R., et al. 1995(2)

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Gerstle Cove Reserve

MLPA Region: North Central (Sonoma County)

Year established: 1971

Area: 0.01 nm² **Shoreline length:** 0.3 nm

Depth range (feet): 0 to 16

Habitat types: Exposed wash rock, gravel/sandy bottom with rocky outcroppings.

Surrounding habitat types: Offshore rocks, rocky walls and boulders; gravel/sandy bottom locally dominant.

Summary of existing regulations: All recreational take prohibited. All commercial take of invertebrates prohibited except lobster, sea cucumber and crab. Commercial take allowed of finfishes. (Title 14, Sections 123 (f)(2)(B), 123 (d), 27.25, 120.7 (o) CCR)

Primary objectives: Protection of an area representative of the ecological characteristics and aquatic organisms of the region.

Existing enforcement: Enforcement has been active in this area, but difficult. This is the major access point for multiple users of the surrounding stretch of coastline.

Baseline and ongoing monitoring and research studies:
DPR conducts periodic resource evaluations.

Basic Evaluation: Anecdotal information suggests that current protection within the Gerstle Cove Reserve has enhanced and provided for increased abundance of individuals of a variety of species. Qualitative surveys conducted shortly after (3 years) the reserve was established indicated an increase in the abalone population within the reserve. This site would benefit from State Marine Reserve designation or it could be incorporated into a larger State Marine Conservation Area plan. An expansion of the boundaries of Gerstle Cove Reserve would enhance the biological diversity that already exists, providing for a larger range of habitat protection. Prohibition of commercial finfish take would provide a refuge for individual species and enforcement would be simplified as no take regulations would make violations obvious.

Published references related to effectiveness of this MPA;
None found.

Department of Fish and Game

Unpublished references related to effectiveness of this MPA;

Anonymous. 1974

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Fort Ross State Historic Park

MLPA Region: North Central (Sonoma County)

Year established: 1970

Area: 0.17 nm² **Shoreline length:** 0.9 nm

Depth range (feet): 0 to 102

Habitat types: Exposed and sheltered coastline with mostly hard bottom; numerous wash rocks, rock shelves interspersed with gravel/sandy bottom. Franciscan sandstone and shale parent rock. Sandy bottom at 60 feet supports an unusual stand of eelgrass.

Surrounding habitat types: Sandy bottom with rocky outcroppings, offshore wash rocks.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: Only abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: State historic parks are established to preserve objects of historical, archaeological, and scientific interest, historic sites and places commemorating important persons or historic events (Public Resources Code 5019.59 and Title 14, Section 4751, CCR)

Department of Fish and Game

Existing enforcement: Long-term cooperative enforcement between State Park Rangers, State Fish and Game Wardens and Sonoma County Sheriff Deputies.

Baseline and ongoing monitoring and research studies: No quantitative studies have been conducted at Fort Ross. State Park System Dive Team and the California Underwater Parks and Preserves Advisory Board have conducted numerous dives here starting in the late 1960s. In 1981, the US Navy worked with parks to document shipwreck sites using on board magnetometers; 14 sites were plotted. Navy and parks divers recorded some sites with video cameras. These videos show the general biota of wreck sites. Marine scientists from Indiana University and DPR have carefully documented this site over the last few years. Qualitative observations of the biota, video and still documentation is in progress.

Basic Evaluation: The primary objective in establishing this state historic park was the preservation of the various shipwreck sites in the area; preservation of these sites is achieved under the current status. The current regulations provide limited protection for the invertebrate species listed above, however this area does not function as a biological reserve. Fort Ross Cove is utilized regularly by Commercial Passenger Fishing Vessels. Two long-term diving rangers have reported substantial declines in rockfish populations over the past 20 years. Commercial urchin fishing currently occurs within the Park boundaries, and could continue as it has had a positive effect on kelp establishment and overall biodiversity. The archeological sites within the current boundaries could be designated as a State Marine Cultural Preservation Area, but any additional regulatory restrictions would need considerable public support to facilitate enforcement.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

Morgan, L.E., et al. 2000; Smith, et al. 1998

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Sonoma Coast State Beach

MLPA Region: North Central (Sonoma County)

Year established: 1970

Area: 0.68 nm² **Shoreline length:** 4.2 nm

Depth range (feet): 0 to 26

Habitat types: Exposed coast with mostly hard bottom, rock shelves with gravel/sandy bottom interspersed.

Surrounding habitat types: Offshore wash rocks, rocky pinnacles and sandy bottom.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: State beaches are designed in areas with frontage on the ocean or bays designed to provide swimming, boat, fishing, and other beach-oriented activities. (Public Resources Code 5019.56 and Title 14, Section 4753, CCR)

Existing enforcement: Long-term cooperative enforcement between State Park Rangers, State Fish and Game Wardens and Sonoma County Sheriff Deputies.

Department of Fish and Game

Baseline and ongoing monitoring and research studies: Many studies by UC Bodega Marine Laboratory, Sonoma State University and the College of Marin. A number of senior projects have been done along Sonoma Coast. Dr Gordon L. Chan, College of Marin, prepared a Marine Coastal Ecology Syllabus (1972) which focuses to the San Francisco Bay Region and useful as well for the Sonoma Coast.

Basic Evaluation: Maximum upwelling values for the west coast system consistently occur along the Sonoma and Mendocino coast. This seasonal process transports nutrient rich water from the deep ocean into the sunlit surface layers near shore. The Bodega Submarine Canyon heads in the southern part of Sonoma Coast State Beach underwater unit and acts as a conduit of nutrient rich water. As upwelling occurs spring and summer, phytoplankton rich waters stimulates the growth of many organisms and produces a highly diverse and productive biota.

The primary objective in establishing this site, as stated above, was to provide for recreational activities, including fishing. The site fulfills this objective. However Sonoma Coast State Beach does not function as a marine protected area other than providing limited protection for invertebrate species. Commercial Passenger Fishing Vessels frequently utilized this area of coastline, and an increase in protection, while providing refuge for many fish species, would meet opposition from consumptive user groups.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Bodega Marine Life Refuge

MLPA Region: North Central (Sonoma County)

Year established: 1965 (full protection established in 1999)

Area: 0.20 nm² **Shoreline length:** 1.0 nm

Depth range (feet): 0 to 36

Habitat types: Rocky outcrops in sandy bottom.

Surrounding habitat types: Exposed coastline, wash rocks, rocky bottom interspersed with sand.

Summary of existing regulations: All commercial and recreational take prohibited.

Primary objectives: Protection of marine plants and invertebrates.

Existing enforcement: Enforcement is effective because of the close proximity of the refuge to the Bodega Marine Laboratory.

Baseline and ongoing monitoring and research studies:

Bodega Marine Laboratory utilizes this refuge on a regular basis for research projects and observation.

Basic Evaluation: This refuge is relatively small and is the only existing MPA in the North Central region which is entirely marine and which has complete protection for all marine organisms. Complete protection has only been afforded to this reserve since 1999, a relatively short time period in which to assess its function as a no-take reserve. However, several studies utilize the reserve as a comparative baseline for species protected from the effects of fishing (i.e., urchins, crab, and abalone). The current boundaries of the refuge are honored and generally accepted by user groups. Any proposed enlargement of the boundaries likely will be met with opposition.

Published references related to effectiveness of this MPA:

Botsford, L.W., et al. 1999

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

Department of Fish and Game

Botsford, L.W. 2001; Botsford, L.W., et al. 1994. MacFarlane, R.B. and E.C. Norton. 1999; Morgan, L.E., et al. 2000(1); Morgan, L.E., et al. 2000(2); Norton, E.C. and R.B. MacFarlane. 1995; Norton, E.C. and R.B. MacFarlane. 1999; Norton, E.C., et al. 2001; Quinn, et al. 1993; Rogers-Bennett, L., et al. 1995; Rogers-Bennett, L. and J.S. Pearse. 2001; Smith, B.D., et al. 1998; Wing, et al. 1995(1); Wing, S.R., et al. 1995(2); Wing, S.R. and M.R. Patterson 1993

Department of Fish and Game

Site name: Point Reyes Headlands Reserve

MLPA Region: North Central (Marin County)

Year established: 1972

Area: 0.60 nm² **Shoreline length:** 3.5 nm

Depth range (feet): 0 to 85

Habitat types: Rocky intertidal and subtidal mixed with sandy bottom.

Surrounding habitat types: Mixture of sand and hard bottom offshore.

Summary of existing regulations: No form of marine life may be taken from the ocean area within 1,000 feet of the high tide mark in the Pt. Reyes Headlands without a written permit from the department issued pursuant to Title 14, Section 650, CCR. Commercial take of lobster, sea cucumber and crab and finfishes allowed. (Title 14, Sections 650, 27.30, 123 (d))

Primary objectives: Protection of invertebrates.

Existing enforcement: Enforcement has been difficult due to the lack of personnel active in the area, as well as the difficulty in distinguishing recreational from commercial fishing from shore.

Baseline and ongoing monitoring and research studies: Baseline data for individual species varies from data collected in 1931 (algae) to 1980 (salmonids). No baseline data for finfish.

Current research includes: No specific research projects related to reserve status.

Basic Evaluation: There are no current studies that speak to the efficacy of this site as a marine protected area; the existing regulations provide limited protection for invertebrates in the nearshore (primary objective). Additional protection may be considered as fishing activities have disturbed marine mammal haul-outs and seabird nesting colonies. This site could be extended seaward to protect birds and mammals and increase protection to benefit nearshore fishes provided that a cooperative enforcement plan with National Park personnel is implemented. A boundary extension of the reserve would be feasible and effective if users groups are consulted.

Published references related to effectiveness of this MPA;

None found.

Department of Fish and Game

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool:

Botsford, L.W. 2001; Wing, S.R., et al. 1995(2)

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Duxbury Reef Reserve

MLPA Region: North Central (Marin County)

Year established: 1971

Area: 0.50 nm² **Shoreline length:** 3.8 nm

Depth range (feet): 0 to 13

Habitat types: Monterey shale, rocky intertidal and subtidal habitat.

Surrounding habitat types: Rocky intertidal and subtidal habitat interspersed with sand.

Summary of existing regulations: No form of marine life may be taken from the ocean area within 1,000 feet of the high tide mark in the Duxbury Reef Reserve without a written permit from the department issued pursuant to Title 14, Section 650, CCR. Recreational take of abalone, Dungeness crab and rock crabs, rockfish, lingcod, cabezon, surfperch, halibut, flounder, sole, turbot, salmon, kelp greenling, striped bass, steelhead, monkeyface-eel, wolf-eel, smelt and silversides allowed. All recreational take of marine aquatic plants prohibited. All commercial take allowed. (Title 14, Sections 650, 27.20, 123 (d) CCR)

Primary objectives: Protect communities of a Monterey shale outcrop, especially the intertidal biota.

Existing enforcement: Enforcement is not effective due to lack of personnel in the area.

Baseline and ongoing monitoring and research studies: Dr. Gordon Chan of the College of Marin conducted several long-term categorical studies as well as a study of user effects on the invertebrate and algae population prior to the reserve designation. Floral and faunal surveys were done by the Gulf of the Farallones National Marine Sanctuary in 1996.

Basic Evaluation: The primary objective in establishing this reserve was to provide protection for invertebrate species while allowing hook-and-line fishing from shore. Due to local conservation education efforts, this reserve fulfills its initial objective to prohibit recreational take of invertebrate species. Use of the area has evolved since the reserve designation and commercial harvest occurs on the reef and near the reef, possibly affecting the populations the original designation was designed to protect. There is considerable community support (including consumptive user groups) for designating this area as a State Marine Reserve.

Department of Fish and Game

Published references related to effectiveness of this MPA;

Chan, G.L. 1968

Unpublished references related to effectiveness of this MPA;

None found.

Published references related to use of this MPA as a research tool

Chan, G.L. 1967

Unpublished references related to use of this MPA as a research tool

Anonymous. 1979

Department of Fish and Game

Site name: James V. Fitzgerald Marine Life Refuge

MLPA Region: North Central (San Mateo County)

Year established: 1969

Area: 0.58 nm² **Shoreline length:** 3.0 nm

Depth range (feet): 0 to 33

Habitat types: Rocky intertidal and subtidal Monterey shale.

Surrounding habitat types: Rocky reefs interspersed with sandy bottom.

Summary of existing regulations: Commercial take of lobster and crab allowed. All recreational take of invertebrates prohibited. All commercial and recreational take of marine aquatic plants prohibited. All recreational take of fishes prohibited except rockfish, lingcod, surfperch, monkeyface eel, rock eel, white croaker, halibut, cabezon, kelp greenling and smelt. All finfish fishing is by hook-and-line or spearfishing only. Commercial take of specific fish species is by Department permit only. (Section 10666, Fish and Game Code, Title 14, Section 123 (d))

Primary objectives: The shoreline and reef area has been of interest to biologists, preservationists, and collectors since as early as 1908. As a result of the popularity of the site, resource depletion has long been an issue. In an effort to protect the area, in the 1960's the County of San Mateo proposed that the State of California designate the area as a state reserve. Legislation was approved for the reserve in 1969.

Existing enforcement: Enforcement of this area is effective because of the combined resources available through the state, county and public. This is a high use area, despite the reserve status, because of its accessibility to the public.

Baseline and ongoing monitoring and research studies: Baselines are old (1975 and 1976) and major changes have occurred. Subsequent baseline study and baseline studies published in 1993. Staff of Fitzgerald Marine Reserve is now compiling new information and has written a Management Plan in respect of how people may use the area.

The San Mateo County Parks and Recreation Division is proposing a resource assessment project for the Fitzgerald Marine Reserve that will 1) determine the amount (if any) of resource degradation from visitation, fishing and gathering; 2) propose, relative to visitation, fishing and gathering, various actions that can best protect the Reserve's natural resources; and 3) evaluate how (if at all) these actions will affect those who visit, fish and

Department of Fish and Game
gather at Fitzgerald Marine Reserve.

Basic Evaluation: Areas within the reserve that are remote from access as well as areas that are policed often function to protect species as originally intended. However, this is a high use area in which the primary concern is user access hampering resource protection. This reserve would benefit from both increased protection (fishing regulations), and foot traffic control. The enforcement resources, as well as public support, exist to facilitate reserve status.

Published references related to effectiveness of this MPA;

Breen, B., et al. 1997; Murray, S., et al. 1997

Unpublished references related to effectiveness of this MPA

None found.

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

North Central Estuarine Areas

Site name: Estero de Limantour Reserve

MLPA Region: North Central (Marin County)

Year established: 1971

Area: 0.64 nm² **Shoreline length:** 10.15 nm

Depth range (feet): not available

Habitat types: Estuarine and marsh

Surrounding habitat types: Intertidal sandy bottom with rocky outcroppings interspersed.

Summary of existing regulations: No form of marine life may be taken below the high water mark in Estero de Limantour without a written permit from the department issued pursuant to Title 14, Section 650, CCR. (Title 14, Sections 650, 27.35, CCR)

Primary objectives: To protect estuarine habitat.

Existing enforcement: Enforcement at this site has been limited.

Baseline and ongoing monitoring and research studies: While no baseline studies have been conducted in this area, monitoring of the area is conducted regularly as part of the National Seashore.

Basic Evaluation: There are no studies reporting the efficacy of this area as a reserve. This area is already fully protected from consumptive use and there is community support to maintain the status.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Tomales Bay Ecological Reserve

MLPA Region: North Central (Marin County)

Year established: 1973

Area: 0.58 nm² **Shoreline length:** 9.08 nm

Depth range (feet): not available

Habitat types: Intertidal marsh and estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Fishing in ecological reserves is generally restricted by method of take. Fishing in Tomales Bay Ecological Reserve shall be permitted from boats as well as from shore; only lightweight, hand-carried boats may be launched and operated. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. Waterfowl may be taken in accordance with the general waterfowl regulations. Swimming, wading, and diving shall be allowed within the reserve. The land area only of the reserve shall be closed to all entry from March 1 through June 30. (Title 14, Sections 630(a), 630(b)(112)(A)(B)(C)(D) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Tomales Bay Ecological Reserve is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Fagan Marsh Ecological Reserve

MLPA Region: North Central (Napa County)

Year established: 1979

Area: 0.50 nm² **Shoreline length:** 5.95 nm

Depth range (feet): not available

Habitat types: Intertidal and estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Fishing in ecological reserves is generally restricted by method of take. Fishing in Fagan Marsh Ecological Reserve shall be permitted from boats as well as from shore; only lightweight, hand-carried boats may be launched and operated. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. Swimming and diving shall be allowed within the reserve. (Title 14, Sections 630(a), 630(b)(45)(A)(B) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Access to Fagan Marsh is difficult. There is no dedicated patrol, but it is patrolled by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Peytonia Slough Ecological Reserve

MLPA Region: North Central (Solano County)

Year established: 1976

Area: 0.62 nm² **Shoreline length:** 4.69 nm

Depth range (feet): not available

Habitat types: Intertidal and estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Fishing in ecological reserves is generally restricted by method of take. Fishing in Peytonia Slough Ecological Reserve shall be permitted from boats as well as from shore; only lightweight, hand-carried boats may be launched and operated. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. Swimming, wading, and diving shall be allowed within the reserve. (Title 14, Sections 630(a), 630(b)(81)(A)(B)(C) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and non-marine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Peytonia Slough is not part of any dedicated patrol by the Department of Fish and Game, however it is patrolled occasionally.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Corte Madera Marsh Ecological Reserve

MLPA Region: North Central (Marin County)

Year established: 1976

Area: 0.69 nm² **Shoreline length:** 2.03 nm

Depth range (feet): 0 to 15

Habitat types: Intertidal marsh and estuarine

Surrounding habitat types: Estuarine

Summary of existing regulations: No mollusks, crustaceans or other invertebrates may be taken (Title 14, Section 123(2)(C)). Fishing in ecological reserves is generally restricted by method of take. Fishing in Corte Madera Ecological Reserve shall be permitted from boats as well as from shore; only lightweight, hand-carried boats may be launched and operated. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(36)(A) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Corte Madera Marsh Ecological Reserve is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Marin Islands Ecological Reserve

MLPA Region: North Central (Marin County)

Year established: 1993

Area: 0.42 nm² **Shoreline length:** 1.93 nm

Depth range (feet): 0 to 15

Habitat types: rocky intertidal

Surrounding habitat types: estuarine

Summary of existing regulations: Fishing in ecological reserves is generally restricted by method of take. Fishing in Marin Islands Ecological Reserve shall be limited to angling from shore. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(70) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Marin Islands Ecological Reserve is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Albany Mudflats Ecological Reserve

MLPA Region: North Central (Alameda County)

Year established: 1986

Area: 0.19 nm² **Shoreline length:** 1.78 nm

Depth range (feet): 0 to 15

Habitat types: Intertidal and subtidal mudflats

Surrounding habitat types: Estuarine and marsh

Summary of existing regulations: Fishing in ecological reserves is generally restricted by method of take. Fishing in Marin Islands Ecological Reserve shall be limited to angling from shore. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(2) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Albany Mudflats Ecological Reserve is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Robert W. Crown Reserve

MLPA Region: North Central (Alameda)

Year established: 1980

Area: not available **Shoreline length:** not available

Depth range (feet): not available

Habitat types: Intertidal and subtidal estuarine habitat consisting primarily of mudflats and sandy bottom.

Surrounding habitat types: Estuarine with sandy bottom

Summary of existing regulations: No plant or invertebrate marine life may be taken between the high tide mark and 150 feet beyond the mean lower low tide mark in that portion of Robert W. Crown Memorial State Beach between the base of the jetty on the northwesterly corner of Crab Cove and a point approximately 2,800 feet southeasterly along the shoreline of Crab Cove opposite the bath house/restroom complex. Hook-and-line fishing is permitted in this area for fin fish only. (Title 14, Section 27.51, CCR)

Primary objectives: Protection of estuarine habitat

Existing enforcement: This reserve is part of regular patrol by the Department of Fish and Game as well as East Bay Regional Park Police and the Alameda Police Department.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Redwood Shores Ecological Reserve

MLPA Region: North Central (San Mateo County)

Year established: 1976

Area: 0.36 nm² **Shoreline length:** 13.82 nm

Depth range (feet): not available

Habitat types: Intertidal estuarine

Surrounding habitat types: Intertidal estuarine and marsh

Summary of existing regulations: No person shall enter this reserve during the period February 15 through May 15 without written permission from the Department. Fishing in ecological reserves is generally restricted by method of take. Fishing in Redwood Shores Ecological Reserve shall be limited to angling from shore. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. Waterfowl may be taken in accordance with the general waterfowl regulations. (Title 14, Sections 630(a), 630(b)(8)(A)(B) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Redwood Shores Ecological Reserve is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Bair Island Ecological Reserve

MLPA Region: North Central (San Mateo County)

Year established: 1986

Area: 2.33 nm² **Shoreline length:** 18.43 nm

Depth range (feet): not available

Habitat types: Intertidal estuarine

Surrounding habitat types: estuarine

Summary of existing regulations: Fishing in ecological reserves is generally restricted by method of take. Fishing in Bair Island Ecological Reserve shall be permitted from boats as well as from shore; only lightweight, hand-carried boats may be launched and operated. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. Swimming, wading, and diving shall be allowed within the reserve. (Title 14, Sections 630(a), 630(b)(92)(A)(B) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Bair Island Ecological Reserve is patrolled regularly by the Department of Fish and Game.

Baseline and ongoing monitoring and research studies: The U.S. Fish and Wildlife Service manages this site for DFG. A GIS map of the area was recently completed.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

South Central Marine Areas

Site name: Hopkins Marine Life Refuge

MLPA Region: South Central (Monterey County)

Year established: 1984

Area: 0.15 nm² **Shoreline length:** 0.95 nm

Depth range (feet): 0 to 60

Habitat types: Mostly granite reef; smaller portions of sand, especially on outside edge

Surrounding Habitat types: Similar

Summary of existing regulations: No recreational or commercial fishing permitted. Scientific collecting by permit only. (FGC Sections 10500, 10502.5, 10657, 10657.5). The recreational harvest of marine plants is prohibited within the entire marine life refuge boundary. (Title 14, Section 30).

Primary objectives: The primary purpose is to allow for research in an area that is free of disturbance due to exploitation.

Existing enforcement: The area is easily-observed from shore, well-known, marked on the seaward boundary by buoys, and staff from the Hopkins Marine Station is on site every day.

Baseline and ongoing monitoring and research studies: Numerous studies of algae, invertebrates, and fish have taken place in the HMLR. Long-term monitoring of the intertidal zone dates back to the 1930-s. The Department carried out relatively intensive fish counts, and some re-monitoring of those counts has taken place. A recent study was completed comparing counts and sizes of benthic fishes in and adjacent to the refuge. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Basic Evaluation: The area contains one of the oldest fully-protected marine research sites in the state and contains a variety of shallow habitat types within a relatively small area. It is a classic example of how a small but fully protected MPA can function well by providing a multitude of research opportunities with populations of marine organisms occurring at natural densities and size frequencies. While it is relatively small, studies have documented significantly greater biomass and size frequencies of nearshore fishes

Department of Fish and Game
compared with adjacent fished areas.

There is a great deal of public support for establishing some form of MPA to the east of and adjacent to HMLR, using 60 feet as the offshore depth boundary. Establishing an MPA from the eastern boundary of HMLR to the base of the Coast Guard Breakwater (in the Cannery Row area) would provide increased protection for marine fishes and invertebrates in an area that is frequently utilized by dive classes, recreational divers, and recreational anglers but would leave the area west of HMLR (the existing Pacific Grove Marine Gardens Fish Refuge) available for recreational fishing. However, there is also considerable local support for increasing the degree of protection within the existing and adjacent Pacific Grove Marine Gardens Fish Refuge. Extension of HMLR offshore would place deeper-water reef areas under protection but would impact fisheries such as commercial passenger fishing vessel (CPFV) and squid. This site is also overlapped by an Area of Special Biological Significance designation.

Published references related to effectiveness of this MPA;

Cooper, J., et al. 1977; Lowry, L.F. and J.S. Pearse. 1973; Miller, D.J. and J.J. Geibel. 1973; Paddack, M.J. and J.A. Estes. 2000; Pearse, J.S. and A.H. Hines. 1987; Sagarin, R.D., et al. 1999; Schaeffer, T.N., et al. 1999; State Water Resources Control Board. 1979.

Unpublished references related to effectiveness of this MPA;

Paddack, M.J. 1996

Published references related to use of this MPA as a research tool:

Brawley, S.H. 1989; DeBevoise, A.E. 1975; Fadlallah, Y.H. 1982; Holts, L.J. and K.A. Beauchamp. 1993; Lyman, B.W. 1975; Russo, A.R. 1984; Seiff, S.R. 1975; Smith, A.M. 1992; Tomanek, L. and G.N. Somero. 1997; Tomanek, L. and G.N. Somero. 1998; Watanabe, J.M. and Cox, L.R. 1975; Williams, R. 1975

Unpublished references related to use of this MPA as a research tool:

Ammann, A. J. 2001; Fadallah, Y.H. 1981; Holyoak, A.R. 1992;

The Hopkins Marine Station web site presently lists more than 150 student papers dating back to 1964, most of which involved at least some field work or collection of organisms with HMLR. The web site address is:

<http://www.marine.stanford.edu/HMSweb/marine-indexes.html>.

Many others have used the HLMR as a site for research both before and after its establishment as an MPA. The library at HLMR maintains an extensive list of abstracts of dissertations by Hopkins Marine Station Ph. D candidates. Dr. Freya Sommner provided the Department with a list of 34 completed or ongoing research projects at HMS since 1994.

Department of Fish and Game

Site name: Pacific Grove Marine Gardens Fish Refuge

MLPA Region: South Central (Monterey County)

Year established: 1984

Area: 1.2 nm²

Shoreline length: 2.5 nm

Depth range (feet): 0 to 60

Habitat types: Mostly granite reef; smaller portions of sand, especially on outside edge. Rock reefs in deeper water have been surveyed by submersibles.

Surrounding habitat types: Similar, except higher proportion of sand bottom offshore.

Summary of existing regulations: Recreational harvest of all fishes, all invertebrates except crustaceans and mollusks, and marine plants is permitted. Commercial harvest of sardines, mackerel, anchovies, herring, squid, and marine plants is permitted. Scientific collecting by permit only. All other extractive uses are prohibited. (FGC Sections 10500, 10660)

Primary objectives: Established by legislative action, the primary objective is to provide protection from exploitation for certain fishes and invertebrates.

Existing enforcement: The area is easily-observed from shore by law enforcement personnel as well as private citizens, is well-known, and benefits from an increased community awareness of the need to protect marine resources. During daylight hours thousands of people pass by or visit the area on a daily basis.

Baseline and ongoing monitoring and research studies: Many researchers from Department and several academic institutions have conducted life-history studies, recruitment studies, and tagging studies in this region. Submersible studies of deeper-water fishes have also been carried out offshore of this site.

Basic Evaluation: The area presently offers some resource protection since regulations prohibit commercial finfishing (except for pelagic species) and allow the harvest of only certain invertebrates. Among the invertebrate species permitted for take, the presence of the sea otter precludes most harvest by man for some of these (e.g. urchin). However, the area does function well as an MPA by providing recreational opportunities, allowing a low but sustainable level of kelp and recreational finfish harvest, and providing a safe and local site for scientific collecting for research and public education. This area contains extensive intertidal and subtidal reef habitat and provides easy access to intertidal areas from shore.

Department of Fish and Game

It also provides a source of kelp for local aquaculture businesses.

This area would likely benefit from increased protection for intertidal invertebrates. There has been a well-organized campaign by local citizens to bring public awareness to the need for increased protection in this area. Closure to recreational finfish fisheries within the entire area would create a region of fully-protected shore that is contiguous with the Hopkins Marine Life Refuge, but would impact local shore fishermen, skiff fishermen, and consumptive divers who now take advantage of easy access and protected ocean conditions. It might be reasonable to partition the area, with part of it having a higher degree of protection for fishes and invertebrates. An intertidal reserve may be a reasonable goal to pursue. Expansion of the site offshore with a concordant increase in degree of protection would likely cause significant impacts to user groups, including the squid and CPFV fisheries. In addition to the above rationale, part of this site is also overlapped by an Area of Special Biological Significance designation.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

Lea, R.N. 1978; Lea, R.N. 1979; Miller, D. J., et al. 1974; Pearse, J.S. and L.F. Lowry. 1974; VenTresca, D. A. Summary report of 1960 Central California Council of Divers Free-diving competition spearfish meet in Point Piños area. California Dept. Fish and Game, Monterey.

Published references related to use of this MPA as a research tool:

Nelson, P. A. 2001

Unpublished references related to use of this MPA as a research tool:

VenTresca, D. A., et al. 1996

Department of Fish and Game

Site name: Carmel Bay Ecological Reserve

MLPA Region: South Central (Monterey County)

Year established: 1976

Area: 1.9 nm²

Shoreline length: 5.8 nm

Depth range (feet): 0 to 465

Habitat types: Granite reef along rocky shores; extensive areas of sand offshore; some granite pinnacles; head of Carmel submarine canyon

Surrounding habitat types: Similar except for the submarine canyon, which has greater depths than in the reserve.

Summary of existing regulations: Recreational harvest of all fishes is permitted. Commercial harvest of kelp is permitted. Scientific collecting by permit only. All other extractive uses are prohibited. (Title 14 Sections 30, 630(a), 630(b)(27))

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: The area is adjacent to population centers, and is therefore easily observed from shore. Pleasure boats, dive boats, and party boats frequent the area. DFG provides enforcement presence on the water as well as from land.

Baseline and ongoing monitoring and research studies: The area near Pescadero Point, Stillwater Cove, and Arrowhead Point is the focus of a number of marine ecological studies, mostly through Moss Landing Marine Labs. San Francisco State University has conducted life-history and recruitment studies of fish in this area. A high school class carries out an ongoing monitoring program. There have also been submersible studies in the surrounding area. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Department of Fish and Game

Basic Evaluation: This area contains reef and sand habitat, a kelp bed, and includes the head of a submarine canyon. It provides opportunities for recreational angling and diving as well as limited commercial kelp harvest but is adjacent to the fully-protected area at Point Lobos. The existing degree of protection is probably consistent with its uses, and the site appears to function well as an MPA with limited harvest. The Department has documented its long term use as a fishing area for recreational anglers on Commercial Passenger Fishing Vessels and in skiffs as well as from extractive free divers (CenCal competitive free-diving competitions). This level of use appears to be sustainable in the absence of commercial fishing for finfish and invertebrates. The presence of the submarine canyon head provides a source of spot prawn recruitment to the commercial trap fishery in the adjacent area. Extension of the Pt. Lobos Ecological Reserve to Mono Lobo (within the Carmel Bay Ecological Reserve) would add a small amount of completely protected area. In addition to the above rationale, this site is also overlapped by an Area of Special Biological Significance designation.

Published references related to effectiveness of this MPA;

Gibson, M.E. 1983; Schlining, K.L. and J.D. Spratt. 1999

Unpublished references related to effectiveness of this MPA;

DeMartini, J.D. and W.J. Barry. 1974; Lea, R.N. 1978; Lea, R.N. 1979; Lea, R.N. 1979; Lea, R.N. and F. Henry. 1980; Lea, R.N. et al. 1982; Malone, C. 1994; Miller, D. J., et al. 1974; Schlining, K. L. 1999; VenTresca, D.A. 1961-1963, 1965, 1968, 1980-1984, 1986-2001

Published references related to use of this MPA as a research tool:

Cripe, D. 1998; Graham, M.H. 1996; Hallacher, L.E. 1977; Hallacher, L.E. 1984; Hallacher, L.E. and D.A. Roberts. 1985; Hoelzer, G. A. 1988; Kenner, M.C. and M.T. Lares. 1991; Konar, B. and M.S. Foster. 1992; Reed, D.C. and M.S. Foster. 1984; Singer, M.M. ; VanWagenen, et al. 1981; Watanabe, J.M. and C. Harrold. 1991; Wedi, S.E. and D.F. Dunn. 1983

Unpublished references related to use of this MPA as a research tool:

Ammann, A. J. 2001; Andrews, H.L. 1938; Carr, M. H. 1983; Nakata, M.H. 1970; Singer, M. M. 1982

Department of Fish and Game

Site name: Point Lobos Ecological Reserve

MLPA Region: South Central (Monterey County)

Year established: 1973

Area: 0.8 nm²

Shoreline length: 6.7 nm

Depth range (feet): 0 to 195

Habitat types: Mostly granite reef dropping from shore to sand bottom. Reef habitat with many crevices and pinnacles. Extensive kelp beds

Surrounding habitat types: Carmel submarine canyon is nearby. Extensive hard bottom offshore, as determined from submersible studies.

Summary of existing regulations: No recreational or commercial fishing permitted. Scientific collecting by permit only. (Title 14, Sections 630(a), 630(b)(88)). The recreational harvest of marine plants is prohibited within the entire ecological reserve boundary. (Title 14, Section 30).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: State Park rangers within the adjacent terrestrial reserve monitor access from shore, and monitor approaches by boats. The presence of visitors every day of the year in the adjacent terrestrial reserve provides an additional deterrent to potential violators of regulations.

Baseline and ongoing monitoring and research studies: UC Santa Cruz student found slightly greater abundances of benthic fish in the reserve than in adjacent areas. Department has conducted habitat-based surveys of fish abundance within the reserve. Submersible surveys have been carried out offshore of the reserve. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Department of Fish and Game

Basic Evaluation: This site contains a complex variety of habitats, primarily hard bottom, and contains high densities of large, adult bottom fishes such as rockfishes and lingcod. Although relatively small, the reserve functions well as a fully protected area because of its high species diversity and variety of habitat, and it is effectively enforced.. Studies by the Department and others have documented high population densities and large sizes of economically important nearshore fish species, in particular rockfishes, lingcod, cabezon, and greenlings, with population densities and size frequencies significantly greater than in adjacent and more distant fished areas. In addition, the site is a prime destination for non-extractive scuba divers, and use is limited by local policy.

This site would be an excellent candidate for expansion from the point of view of habitat protection, but it could cause significant impacts to users groups. The region is approximately 10 miles from a major central coast port (Monterey). Expansion to the north in the area west of the Carmel Bay Ecological Reserve would include part of the Carmel Submarine Canyon but would impact existing commercial fisheries such as spot prawn and hook-and-line finfish, as well as recreational CPFV fisheries. Expansion to the south (to Yankee Point or beyond) would add additional area extensive rock reef habitat but would impact commercial and recreational finfish fisheries. Offshore extension of the reserve would add deeper reef habitat but would impact existing commercial fisheries such as spot prawn and hook-and-line finfish, as well as recreational CPFV fisheries. As an alternative to expanding this site, a more suitable location in terms of less socioeconomic impact might be possible to the south between Point Lobos and Point Sur. In addition to the above rationale, this site is also overlapped by an Area of Special Biological Significance designation (which will be re-named State Water Quality Protection Area).

Published references related to effectiveness of this MPA;

Baldrige, A. and L.L. Rogers. 1991; Hanggi, E.B. and R.J. Schusterman. 1994; Long, D.J. 1992; Paddock, M.J. and J.A. Estes. 2000; Riedman, M.L. and J.A. Estes. 1988; VenTresca, D.A., et al. (In prep.)

Unpublished references related to effectiveness of MPAs:

Cazanian, G.V., et al. 1979; DeMartini, J.D. and W.J. Barry. 1977; Drury, A. 1970; Lea, R.N. 1978; Lea, R.N. 1979; Lea, R.N. 1979; Lea, R.N. 1982; Lea, R.N. 1993; Nichols, D.R., et al. 1974; Paddock, M.J. 1996; Reilly, P.N., et al. 1998; Reilly, P.N., and D.A. VenTresca. 1999; Thompson, T. 1974

Published references related to use of this MPA as a research tool:

Gingras, M.L., et al. 1998; Johansen, H.W. and L.F. Austin. 1970

Unpublished references related to use of this MPA as a research tool:

Castleton, M. R. 2000

Department of Fish and Game

Site name: Julia Pfeiffer Burns State Park

MLPA Region: South Central (Monterey County)

Year established: 1970

Area: 2.1 nm²

Shoreline length: 4.0 nm

Depth range (feet): 0 to 710 for park boundary, which extends 6000 feet offshore, but site-specific regulations apply to the harvest of invertebrates only within 1000 feet from shore, which is approximately 60 feet deep.

Habitat types: Hard and soft bottom. Five sub-categories of habitat: 1) Giant kelp beds; 2) pinnacles and underwater cliffs; 3) Diopatra (worm) tube beds; 4) unstable gravel and boulder fields; 5) surge channels; Some pinnacles have up to 75 ft of vertical relief in over 50 ft horizontally.

Surrounding habitat types: Similar habitats are found to south. To the north, Partington Canyon extends close to shore. Offshore is a mixture of hard and soft bottom, with some depths exceeding 300 fathoms (1,800 ft) within 3 miles of shore.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. However, in this and other MPAs south of San Francisco, the harvest of abalone is prohibited. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Department of Fish and Game

Primary objectives: This site was established to protect unique habitat primarily due to prevalence of outstanding wall and pinnacle communities. It contains the most extensive series of pinnacles and underwater cliffs along the Big Sur Coast.

Existing enforcement: Enforcement is aided by the lack of access to intertidal and subtidal area from shore (although fishing from shore occurs at Partington Point) due to park requirements to stay on trails. Department of Park and recreation staff provide on site presence. Department of Fish and Game provides on-water presence. Commercial and recreational harvest restrictions pertain to invertebrates only, and for those which might be taken illegally, access is difficult at best.

Baseline and ongoing monitoring and research studies: Moss Landing Marine Laboratories- extensive diving surveys from 1987 to 1989 with some follow-up in mid 1990's, related to impacts of the massive landslide and subsequent manipulations by Caltrans in 1983-84. Extensive qualitative survey of plant, invertebrate, and fish communities in five sub-habitat types. Contacts: John Oliver, MLML, and Jim Barry, DPR. Side-scan sonar maps and data available from Nancy Wright. Surveys done by Rick Kvitek in 1994, 1995, 1997, and 1998.

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. Among the allowable species, the presence of the sea otter precludes most harvest by man for some of these (e.g. crab, urchin) or the species is not found here (lobster). However, the area does function well by providing recreational opportunities. This area could be increased to State Marine Reserve status, due to the unique nature of its habitat and its high potential resource value, but would be contentious due to recreational fishing that occurs from shore, and the commercial nearshore fishery which uses the area. If the regulations for a SMR were applied throughout the park to 6000 feet offshore, this would result in an expansion of the MPA as well as an increase in protection. This area was recommended for expansion in the Department of Parks and Recreation (DPR) Master Plan from 1984. DPR has a long-term data base here, including information on habitat, fishes, invertebrates, and algae. At present, except for Big Creek State Marine Reserve, there are no other complete no-take areas between Pt. Lobos Ecological Reserve, and Vandenberg State Marine Reserve. The northern Boundary of Big Creek State Marine Reserve is about 5 miles from southern boundary of Julia Pfeiffer Burns State Park.

As an alternative to expanding the existing area or increasing the degree of protection, a State Marine Conservation Area, with protection for bottom fishes, immediately adjacent and to the north, near Partington Point, would provide habitat protection for a submarine canyon as well as shallower hard and soft bottom habitat in an MPA network. The existing regulations in Julia Pfeiffer Burns State Park (which would become Julia Pfeiffer Burns SMCA without any changes in boundaries or regulations) would continue to afford protection to many invertebrate species. In addition to the above rationale, this site is also

Department of Fish and Game
overlapped by an Area of Special Biological Significance designation.

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

Burdett, K.S., et al. 1990; Lea, R.N. 1979; Lea, R.N. 1979; Lea, R.N., et al. 1982;
Seltenrich, C.P., et al. 1980

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Big Creek Marine Resources Protection Act Ecological Reserve*

*As of January 1, 2002 the name of this site was officially changed by the Marine Managed Areas Improvement Act to: Big Creek State Marine Reserve

MLPA Region: South Central (Monterey County)

Year established: 1994

Area: 1.9 nm²

Shoreline length: 2.7 nm

Depth range (feet): 0 to 300

Habitat types: Soft intertidal: est. 10%; Hard intertidal: est. 90%; Soft subtidal: est. 18%; Hard subtidal: est. 82%; Soft shelf: est. 88%; Hard shelf: 12%; Kelp beds; many wash rocks and pinnacles.

Surrounding habitat types: To the north and south a mixture of hard and soft bottom with scattered kelp beds . Several heads of submarine canyons adjacent on seaward side.

Summary of existing regulations: No recreational or commercial fishing or harvest is permitted. Scientific collecting by permit only. (Title 14, Section 630.5). No disturbance of bottom; no boats, diving or other use (boat transit only); public entry restricted.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Big Creek State Marine Reserve (originally named the Big Creek Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was ""to provide for scientific research related to the management and enhancement of marine resources"".

Existing enforcement: Full-time reserve manager provides on-site presence. Local users of adjacent areas (skiff fishermen), who are allowed access through the reserve, assist in insuring compliance with regulations. DFG provides on-water enforcement presence.

Baseline and ongoing monitoring and research studies: Benthic habitat mapping and characterization: baseline information for entire reserve (Yoklavich, VenTresca). Mapping ocean currents and related hydrographic studies: ongoing research (C. Collins, F. Schwing). Benthic fish surveys: baseline research; deep (Yoklavich), subtidal (VenTresca, Paddock). Benthic Invertebrates; some baseline; intertidal (Pearse); subtidal (Mira Parks). Local Fishery (social aspects; Pomeroy, Smiley). PISCO long-term subtidal monitoring

Basic Evaluation: This site contains a variety of habitats with hard and soft substrates, including kelp beds, and is one of the few existing MPAs which extend to 50 fm depth. This site functions well as a completely protected area while allowing research, particularly the documentation of population densities of nearshore and offshore fishes. Studies by the Department, National Marine Fisheries Service, and others have quantified density and size frequency of populations of rockfishes, lingcod, cabezon, and other economically important finfishes within and outside the reserve boundaries, and have found significant numbers of large, reproductively mature fishes within as well as adjacent to this site. Populations of fishes in adjacent areas are of higher density than within fished areas closer to ports, primarily due to the remoteness of the areas and their difficult access from shore. If fishing pressure increases in the future in adjacent areas, the reserve will continue to serve as a baseline for indices of natural populations. The reserve benefits from the presence of an on-site manager and has excellent enforcement.

This site could benefit from extending boundaries offshore for the purpose of maintaining a larger portion of an intact ecosystem. There are presently no State Marine Reserves in California which extend to 3 miles offshore, and the existing array of MPAs does not include adequate representation of deep-water habitat, particularly in depths exceeding 50 fm. This area would be a likely candidate because it already has full protection inshore, is relatively remote for central California standards, and would include a wider variety of habitat within an MPA. An expanded SMR at this site would allow the natural ecological functions to occur in this area and would enhance economically important species, including lingcod and rockfishes such as bocaccio, yelloweye, canary, vermillion, and yellowtail.

Published references related to effectiveness of this MPA;

Ferguson, A. (ed.) 1984; Paddock, M.J. and J.A. Estes. 2000; Pomeroy, C. 1999; VenTresca, D.A., et al. (in prep); VenTresca, D.A., et al. 1998; Yoklavich, M., et al. 1997; Yoklavich, M. et al. (In prep).

Unpublished references related to effectiveness of this MPA;

Gingras, M.L. 1997; Gingras, M.L. 1998; Gingras, M.L. 1998; Houk, J.L. 1994; Lea, R.N., et al. 1982; Lea, R.N. 1982; Lea, R.N. 1993; Lea, R.N. and P.N. Reilly. 1999; Malone, C. 1994; Paddock, M.J. 1996; Pattison, C.A. 1995; Pomeroy, C. 1996; Reilly, P.N., et al. 1994; Reilly, P.N., et al. 1995; Reilly, P.N., et al. 1996; Reilly, P.N., et al. 1997; Reilly, P.N., et al. 1998; Reilly, P.N., and D.A. VenTresca. 1999; Reilly, P.N., et al. 2000; Smiley, J. 2000; VenTresca, D., et al. 1999; VenTresca, D.A., et al. ; Wilson, C.E. 1996; Yoklavich, M., et al. 1997.

Published references related to use of this MPA as a research tool:

Pomeroy, C. 1999; Pomeroy, C. and J. Beck. 1998

Department of Fish and Game

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Atascadero Beach Pismo Clam Preserve

MLPA Region: South Central (San Luis Obispo County)

Year established: 1985

Area: 3.9 nm² **Shoreline length:** 1.5 nm

Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding Habitat types: similar

Summary of existing regulations: Clams may not be taken. (FGC Sections 10500, 10711; Title 14 Section 29.40(d)(2))

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: DFG provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Since this MPA no longer satisfies its primary objective, this area could be deleted from the existing array of MPAs.

Published references related to effectiveness of this MPA;
Pattison, C. 2001

Unpublished references related to effectiveness of this MPA;
Pattison, C.P. 1985-2000

Published references related to use of this MPA as a research tool:
None found.

Unpublished references related to use of this MPA as a research tool:
None found.

Department of Fish and Game

Site name: Morro Beach Pismo Clam Preserve

MLPA Region: South Central (San Luis Obispo County)

Year established: 1985

Area: 4.9 nm²

Shoreline length: 1.9 nm

Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Clams may not be taken. (FGC Sections 10500, 10711; Title 14 Section 29.40(d)(3))

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: DFG provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Since this MPA no longer satisfies its primary objective, this area could be deleted from the existing array of MPAs.

Published references related to effectiveness of this MPA;

Pattison, C. 2001

Unpublished references related to effectiveness of this MPA;

Pattison, C.P. 1985-2000

Published references related to use of this MPA as a research tool:

None found.

Unpublished references related to use of this MPA as a research tool:

None found.

Department of Fish and Game

Site name: Pismo Invertebrate Preserve

MLPA Region: South Central (San Luis Obispo County)

Year established: 1977

Area: 0.05 nm² **Shoreline length:** 0.3 nm

Depth range (feet): 0 to 16

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Recreational harvest of fishes permitted.
Commercial harvest of fishes, crab, and kelp permitted. Scientific collecting by permit only.
All other extractive activities prohibited. Title 14, Sections 27.42, 30, 123(d), 123(f)(2)(B)

Primary objectives: To establish baseline for sea otter impact to clam population

Existing enforcement: DFG provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled by
The Department in winter to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Since this MPA no longer satisfies its primary objective, this area could be deleted from the existing array of MPAs.

Published references related to effectiveness of this MPA;
Pattison, C. 2001

Unpublished references related to effectiveness of this MPA;
Pattison, C.P. 1977-2000

Published references related to use of this MPA as a research tool:
None found.

Unpublished references related to use of this MPA as a research tool:
None found.

Department of Fish and Game

Site name: Pismo-Oceano Pismo Clam Preserve

MLPA Region: South Central (San Luis Obispo County)

Year established: 1985

Area: 11.9 nm² **Shoreline length:** 4.6 nm

Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Clams may not be taken. (FGC Sections 10500, 10711; Title 14 Section 29.40(d)(1))

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: DFG provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Otters have depleted the population of legal size clams to the extent that there are virtually no legal size clams to protect. Since this MPA no longer satisfies its primary objective, this area could be deleted from the existing array of MPAs.

Published references related to effectiveness of this MPA;
Pattison, C. 2001

Unpublished references related to effectiveness of this MPA;
Pattison, C.P. 1985-2000

Published references related to use of this MPA as a research tool:
None found.

Unpublished references related to use of this MPA as a research tool:
None found.

Department of Fish and Game

Site name: Vandenberg Marine Resources Protection Act Ecological Reserve*

*As of January 1, 2002 the name of this site was officially changed by the Marine Managed Areas Improvement Act to: Vandenberg State Marine Reserve

MLPA Region: South Central (Santa Barbara County)

Year established: 1994

Area: 2.0 nm²

Shoreline length: 4.5 nm

Depth range (feet): 0 to 60

Habitat types: The area contains a mixture of hard and soft bottom. This is a high energy area that is likely heavily scoured.

Surrounding habitat types: Fairly similar to north, south, and offshore, although a higher percentage of soft bottom to the north.

Summary of existing regulations: No recreational or commercial fishing permitted. Scientific collecting by permit only. (Title 14, Section 630.5). No disturbance of bottom; no boats, diving or other use (boat transit only); public entry restricted. In offshore area outside boundaries a recent ban on gill nets was enacted legislatively.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Vandenberg State Marine Reserve (originally named the Vandenberg Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources".

Existing enforcement: Access from land is restricted via Air Force Base efforts. This is a very remote location that is publicly inaccessible from land and sea.

Baseline and ongoing monitoring and research studies:

Benthic habitat mapping (Cochrane USGS). Mapping ocean currents and related hydrographic studies: ongoing research (Russ Vetter, NMFS). Eggs and larval fish surveys: research (Vetter, NMFS). Abalone enhancement, growth studies (Friedman, Haaker). Intertidal invertebrate surveys (PISCO-Pete Raimondi, UCSC; Steve Murray). Evaluation of effects of oil spill on intertidal (Pete Raimondi, UCSC; Andy Lisner, MMS). Some baseline data on fish abundance in the adjacent Purisima Point area exists from a Department research cruise in 1998.

Basic Evaluation: This site contains primarily shallow soft-bottom substrate but includes some low-relief subtidal reef. Based on Department surveys in the late 1990s, the site and the immediately adjacent area appear to function well in protecting high population densities of black abalone. The adjacent area, while not within an MPA, benefits from military-imposed restricted access. No other sites along the southern California mainland contain high densities of black abalone.

A significantly larger MPA, in the form of a State Marine Conservation Area, could be created without causing any additional negative socioeconomic impact on users, who are already excluded from Military Zone 4 and Zone 5 with few exceptions. Zone 4 is enforced as a no-stopping area by the Air Force. Some fishing does occur if it does not require stopping or loitering (i.e., salmon trolling), so a logical option would be to create a SMCA with all fishing prohibited except for salmon trolling in the area outside the existing Vandenberg Ecological Reserve, while retaining the complete no-take provisions of Vandenberg Ecological Reserve. Resources within this site could benefit from extending boundaries to north and westward. Expanding the existing MPA would incorporate brown rockfish (an important nearshore species) habitat, which is not adequately represented within existing MPAs, and would enhance other economically important species, particularly lingcod, cabezon, greenlings, and rockfishes such as gopher, yellowtail, blue, vermillion, canary, bocaccio, and copper. There is some diving that goes on in Zone 4, but this activity is by permission only and the military estimates that they have 1-2 dive requests per year, largely at the southern end of zone 4 near Destroyer Rock

Published references related to effectiveness of this MPA;

None found.

Unpublished references related to effectiveness of this MPA;

Friedman, C. S., et al. 2001.

Published references related to use of this MPA as a research tool:

Watson, W., et al. 1999

Unpublished references related to use of this MPA as a research tool:

None found.

South Central Estuarine Areas

Site name: Elkhorn Slough Ecological Reserve

MLPA Region: South Central (Monterey County)

Year established: 1980

Area: 1.7 nm² **Shoreline length:** 2.7 nm

Depth range (feet): 0 to 10

Habitat types: Estuary with soft bottom

Surrounding habitat types: Similar estuarine soft bottom habitat.

Summary of existing regulations: Existing regulations state @fishing shall be conducted from only those specific areas of the reserve designated by the department.@ (Title 14, Sections 630(a), 630(b)(43)). At present there are no such areas. The recreational harvest of marine plants is prohibited within the entire ecological reserve boundary. (Title 14, Section 30).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. The Elkhorn Slough Ecological Reserve was established to protect sensitive salt marsh, mudflat, and open water habitats, and to provide a quality, undisturbed estuarine site for education, restoration, research and monitoring.

Existing enforcement: The area is easily-observed, well-known, almost surrounded by land, and has a Department of Fish and Game facility on site.

Baseline and ongoing monitoring and research studies: Monthly volunteer water quality monitoring since 1988 at 24 sites around the Slough, including the Reserve. Continuous water quality monitoring, using four sites (two on the Reserve), to measure temperature, salinity, turbidity, dissolved oxygen and pH. Hyperspectral images are being used to map the distribution of plant communities of interest (nuisance algae, eelgrass,

Department of Fish and Game

pickleweed, native grasses, and noxious weeds). Tidal erosion rates at about 40 intertidal stations along the main channel and on the reserve are monitored annually. Abundance, feeding rates, and reproductive success of herons, egrets, and cormorants in rookeries are assessed by volunteers. Caspian Tern breeding success is being monitored. Distribution, abundance, and diversity of shorebirds and waterbirds at seven ponds and tidal lagoons on the reserve are monitored to detect long-term changes or short-term anomalies. Native and invasive crabs are monitored along the estuarine gradient, in areas of different land use. Tracking of shark and ray abundances occurs at one site on the reserve.

Current research includes: 1) Investigation of use of mudflats and other intertidal habitats by shorebirds, and the influence of tidal and seasonal dynamics. 2) Comparison of invertebrate communities associated with native oyster beds vs. invasive tubeworm beds. 3) Experiments and time series analysis to determine whether invasive upland plants are invading the ecotone and high marsh.

Basic Evaluation: Existing regulations state @fishing shall be conducted from only those specific areas of the reserve designated by the department.@At present there are no such areas and the reserve functions as no-take. With on-site presence of Department staff, and with a history of baseline monitoring and research studies, the site functions well as one of the few fully-protected (although informal) estuarine areas in the state. Its level of formal protection should likely be increased to match this.

Published references related to effectiveness of this MPA;

Yoklavich, M.M., et al. 1991; Yoklavich, M.M., et al. 1992.

Unpublished references related to effectiveness of this MPA;

Cailliet, G.M., et al. 1977

Published references related to use of this MPA as a research tool:

Byers, J. 1999; Grosholz, E.D. and G.M. Ruiz. 1995; Talent, L.G. 1982; Wasson, K., et al. 2001

Unpublished references related to use of this MPA as a research tool:

Allen, J. K., 1992; Kao, J. S. 2000; King, J. M., et al. 1986

South Region Marine Areas

Site name: San Miguel Island Ecological Reserve

MLPA Region: South (Santa Barbara County)

Year established: 1977

Area: 27.69 nm² **Shoreline length:** 49.71 nm

Depth range (feet): 0 to 250

Habitat types: Shoreline is approximately 80% rock 20% sand. Offshore is approximately 75% hard substrate at all depths. Kelp beds, surfgrass, sand beaches, rocky intertidal, ghost shrimp flats, seabird colonies, pinniped rookeries.

Surrounding habitat types: Deeper water reefs and soft bottom habitats. Santa Rosa Island to the east, offshore rocks and pinnacles to the northwest.

Summary of existing regulations: No commercial take of invertebrates, except lobster, sea urchin and rock crab. No commercial or recreational take of marine aquatic plants. Fish and Game Code Secs. 1583, 1584; Title 14 Sec. 630(a)(b)(102),

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose for Ecological Reserve status at San Miguel Island was to protect pinnipeds which have large rookeries here.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. National Park Service rangers are present on site, though not at all times.

Baseline and ongoing monitoring and research studies: Two Channel Islands National Park Kelp Forest Monitoring sites (est. 1982), four Rocky Intertidal Monitoring

Department of Fish and Game

sites (est. 1985). National Marine Fisheries Service field station for extensive pinniped work at Point Bennett. Seabird Monitoring primarily on Prince Island and biannual snowy plover counts. Department conducts periodic abalone and sea urchin surveys. San Miguel Island sites were included in the BLM Outer Continental Shelf Studies in the late 1970s. Sites at Crook Point and Cuyler Harbor were established during the 1975-79 BLM-sponsored studies of rocky intertidal biota.

Basic Evaluation: Currently provides protection to a limited number of resources in the colder water region of the northern Channel Islands, however, take of almost all commercial and recreational target species is allowed. Long term baseline monitoring program will provide information on effects of varying levels of protection. The reserve contains a diversity of habitat and species including significant seabird and pinniped rookeries. The area has the most significant red abalone population remaining in southern California. The reserve is within a National Park, National Marine Sanctuary, International Biosphere Reserve, and Area of Special Biological Significance. Current proposals to establish three new MPAs encompassing over 55 nm² of state waters at San Miguel Island, including no-take reserves, could significantly increase the level and area of resource protection at this site. A wide range of habitats and resources present in this colder water region will be represented by these proposed MPAs. They are also designed to provide connectivity with other MPAs and open areas at the Channel Islands through movements of adult and juvenile organisms and transport of larvae.

Published references related to effectiveness of this MPA:

Schroeter, S. C., et al. 2001

Unpublished references related to effectiveness of this MPA:

Cochrane, G.R., et al. 2001; Watson, W., et al. 2001

Published references related to use of this MPA as a research tool:

Burton, R.S. and M. J. Tegner. 2000; Richards, D.V. and G.E. Davis. 1993; Schroeter, S. C., et al. 2001

Unpublished references related to use of this MPA as a research tool:

Cochrane, G.R., et al. 2001; Davis, G. E. 1985; Davis, G. E. 1986; Kushner, et al. 1995a; Kushner, et al. 1995b; Kushner, D. J., et al. 1997a; Kushner, D. J., et al. 1997b; Kushner, D. J., et al. 1998; Kushner, D. J., et al. 2000; Kushner, D. J., et al. 2001; Richards, D. V. 1986; Richards, D. V. 1988; Richards, D. V. 1994; Richards, D. V., et al. 1997; Richards, D.V., et al. 1993a; Richards, D.V. and D. Kushner. 1994; Richards, D.V., et al. 1993b; Richards, D. V. 1998; Watson, W., et al. 2001; Littler, M. M. (ed.) 1977; Littler, M. M. (ed.). 1978; Littler, M. M. (ed.). 1979

Department of Fish and Game

Site name: Anacapa Island Ecological Reserve

Site name: South (Ventura County)

Year established: 1978

Area: 14.14 nm²

Shoreline length: 20.41 nm

Depth range (feet): 0 to 600

Habitat types: Nearly 100% rocky shoreline and intertidal zone with rocky reef to 20 m depth and rock reef scattered below that. 0-30 m hard substrate 60%, 30-200 m hard substrate approximately 10%. Kelp forests, surf grass and small areas of eelgrass.

Surrounding habitat types: Deeper water reefs and soft bottom habitats. Santa Cruz Island to the west.

Summary of existing regulations: No commercial take of invertebrates except crabs, ghost shrimp, jackknife clams, sea urchins, squid and worms. No recreational take of marine aquatic plants. No commercial or recreational take of invertebrates in two special closures. Fish and Game Code Secs. 1583, 1584; Title 14 Sec. 630(a)(b)(5).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. National Park Service rangers are present on site, though not at all times.

Baseline and ongoing monitoring and research studies: Channel Islands National Park has three fixed sites for the Kelp Forest Monitoring program, (est. 1982) and three Rocky Intertidal Monitoring sites (est. 1982, expanded 1985 for black abalone). There is a pink abalone enhancement study site (density enhanced through transplants to increase reproduction), a joint Department and Channel Islands National Park project. Jack Engle (UCSB/CIRP) has a long-term cup coral study area. Eelgrass and soft bottom

Department of Fish and Game

invertebrates have been surveyed (CIRP/NPS). Currently there is a giant sea bass study with sonic tags on a number of fish. CINMS has been conducting side-scan sonar surveys around Anacapa Island. Anacapa sites were included in the BLM Outer Continental Shelf Surveys in the late 1970s when two sites were established at Frenchys Cove. Channel Islands National Park has surveyed deep-water areas in the Delta Submarine during white abalone surveys

Basic Evaluation: Currently provides protection to a limited number of resources in the warmer water region of the northern Channel Islands, however, take of almost all commercial and recreational target species is allowed with increased levels of protection for invertebrates in two smaller areas. Long term baseline monitoring program will provide information on effects of varying levels of protection. The area has a diversity of habitat and species including sensitive seabirds; giant sea bass; white, black, pink, and green abalone. Kelp bass and sheephead were found in higher densities and larger sizes in the seasonal pelican fledging closure area of this MPA than in nearby areas open to harvest indicating that even that limited level of increased protection is benefiting these desirable species to a greater extent than general fishery regulations elsewhere. It is within a National Park, National Marine Sanctuary, International Biosphere Reserve, and Area of Special Biological Significance. Current proposals to establish two new MPAs encompassing nearly 20 nm² of state waters at Anacapa Island, including a no-take reserve, could significantly increase the level and area of resource protection at this site. A wide range of habitats and resources present in this warmer water region will be represented by these proposed MPAs. They are also designed to provide connectivity with other MPAs and open areas at the Channel Islands through movements of adult and juvenile organisms and transport of larvae. In addition, spawning aggregation areas for leopard shark and giant seabass would also be protected under this proposal.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

Tetreault, I. and R.F. Ambrose. (in prep.); Cochrane, G.R., et al. 2001; Watson, W., et al. 2001

Published references related to use of this MPA as a research tool:

Richards, D.V. and G.E. Davis. 1993

Unpublished references related to use of this MPA as a research tool:

Cochrane, G.R., et al. 2001; Davis, G. E. 1985; Davis, G. E. 1986; Kushner, et al. 1995a; Kushner, et al. 1995b; Kushner, D. J., et al. 1997a; Kushner, D. J., et al. 1997b; Kushner, D. J., et al. 1998; Kushner, D. J., et al. 2000; Kushner, D. J., et al. 2001; Richards, D. V. 1986; Richards, D. V. 1988; Richards, D. V. 1994; Richards, D. V., et al. 1997; Richards, D.V., et al. 1993a; Richards, D.V. and D. Kushner. 1994; Richards, D.V., et al. 1993b;

Department of Fish and Game

Richards, D. V. 1998; Tetreault, I. and R.F. Ambrose. (in prep.); Watson, W., et al. 2001;
Littler, M. M. (ed.). 1979

Department of Fish and Game

Site name: Anacapa Island Ecological Reserve Natural Area

MLPA Region: South (Ventura County)

Year established: 1978

Area: N/A **Shoreline length:** N/A

Depth range (feet): 0 to 60

Habitat types: Nearly 100% rocky shoreline and intertidal zone with rocky reef to 20 m depth and rock reef scattered below that. Approximately 80 % hard substrate overall. There are kelp beds and surfgrass areas through the area.

Surrounding Habitat types: Nearshore kelp forest and reef habitat with interspersed sandy areas.

Summary of existing regulations: No commercial or recreational take of any marine life. Fish and Game Code Secs. 1583, 1584; Title 14 Sec. 630(a)(b)(5)(B).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose of the Anacapa Island Natural Area was to provide an area of nearshore kelp forest habitat within the larger Anacapa Island Ecological Reserve which was completely protected from take.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. National Park Service rangers are present on site, though not at all times.

Baseline and ongoing monitoring and research studies: Channel Islands National Park has two fixed sites for the Kelp Forest Monitoring program, (est. 1982) within the natural area. Comparisons of fish inside and out of the reserve were made by Larson (2000). Tetreault (2000) made independent assessments of fish inside and out of the reserve. Schroeter et al. (2001) used a BACI analysis of Channel Islands National Park data to look at fishery effects on sea cucumbers. There is a pink abalone enhancement

Department of Fish and Game

study site (density enhanced through transplants to increase reproduction), a joint Department and Channel Islands National Park project. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had a permanent subtidal monitoring site here for several years.

Basic Evaluation: Provides complete protection of marine life in a limited area in the warmer water region of the Northern Channel Islands. Provides an opportunity to evaluate effects of complete protection on resident species. This site has a diversity of habitat and species, but encompasses a relatively small portion of the habitat in the area extending only to a depth of 20m and may be affected by intense edge fishing for finfish and lobster. Nevertheless, kelp bass and sheephead were found in higher densities and larger sizes in this MPA than in nearby areas open to harvest indicating that this MPA is protecting these desirable species to a greater extent than general fishery regulations elsewhere. Sea cucumber abundances were stable or increased here compared to other sites at the Channel Islands open to harvests of that species. Lobster populations were higher and lobster and sea urchin populations more stable in this MPA as well. It is within an ecological reserve, National Park, National Marine Sanctuary, International Biosphere Reserve, and Area of Special Biological Significance. Current proposals to establish two new MPAs at Anacapa Island include a no-take reserve encompassing and greatly expanding the area this MPA. A wide range of habitats and resources present in this warmer water region will be represented by this proposed MPA. It is also designed to provide connectivity with other MPAs and open areas at the Channel Islands through movements of adult and juvenile organisms and transport of larvae.

Published references related to effectiveness of this MPA;

Schroeter, et al. 2001. Laferty, K.D. and D.J. Kushner. 2000

Unpublished references related to effectiveness of this MPA;

Tetreault, I. and R.F. Ambrose. (in prep.); Larson, R. J. 2000

Published references related to use of this MPA as a research tool:

Richards, D.V. and G.E. Davis. 1993; Schroeter, S. C., et al. 2001

Unpublished references related to use of this MPA as a research tool:

Davis, G. E. 1985; Davis, G. E. 1986; Kushner, et al. 1995a; Kushner, et al. 1995b; Kushner, D. J., et al. 1997a; Kushner, D. J., et al. 1997b; Kushner, D. J., et al. 1998; Kushner, D. J., et al. 2000; Kushner, D. J., et al. 2001; Richards, D. V. 1986; Richards, D. V. 1988; Richards, D. V. 1994; Richards, D. V., et al. 1997; Richards, D.V., et al. 1993a; Richards, D.V. and D. Kushner. 1994; Richards, D.V., et al. 1993b; Richards, D. V. 1998; 2001; Larson, R. J. 2001

Department of Fish and Game

Site name: Santa Barbara Island Ecological Reserve

MLPA Region: South (Santa Barbara County)

Year established: 1978

Area: 6.25 nm²

Shoreline length: 17.85 nm

Depth range (feet): 0 to 350

Habitat types: Shoreline is almost entirely rocky. Offshore is approximately 70-80% rocky at all depths. Giant kelp beds, elk kelp beds, surf grass and purple hydrocoral occur throughout the area. Seabird colonies and pinniped rookeries are located at several sites along the shore and on the island.

Surrounding habitat types: Deeper water reefs and soft bottom habitats.

Summary of existing regulations: No commercial take of invertebrates except crabs, ghost shrimp, jackknife clams, sea urchins, squid and worms. No recreational take of marine aquatic plants. No commercial or recreational take of invertebrates in one special closure. Fish and Game Code Secs. 1583, 1584; Title 14 Sec. 630(a)(b)(102).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. National Park Service rangers are present on site, though not at all times.

Baseline and ongoing monitoring and research studies: Channel Islands National Park has three Kelp Forest Monitoring program sites (est., 1982-1985) and two Rocky Intertidal Monitoring sites (est. 1985). Extensive seabird monitoring. White abalone surveys by submarine. Department conducts periodic abalone and sea urchin surveys. A site at Cave Canyon was established as part of the BLM Outer Continental Shelf Studies in the late 1970s.

Basic Evaluation: Currently provides protection to a limited number of resources in the transitional area between cold and warm water regions at the northern Channel Islands, however, take of almost all commercial and recreational target species is allowed with increased levels of protection for invertebrates in one smaller area. Long term baseline monitoring program will provide information on effects of varying levels of protection. The reserve contains a diversity of habitat and species including significant seabird and pinniped rookeries. The area has significant habitat for white, pink, and green abalone populations. The reserve is within a National Park, a National Marine Sanctuary, an International Biosphere Reserve, and an Area of Special Biological Significance, as well as the recently established Cowcod Conservation Areas which prohibit most finfishing in depths beyond 20 fm. Current proposals to establish a new no-take MPA encompassing over 13 nm² of state waters at Santa Barbara Island could significantly increase the level and area of resource protection at this site. Although the restrictions of the Cowcod Conservation Areas would be lifted from a portion of the remaining state waters around this site as part of the proposal, this would be offset by the complete protection in the proposed MPA and other proposed MPAs in deeper waters at the Channel Islands. A wide range of habitats and resources present in this transitional area between cold and warm regions will be represented by this proposed MPA. It is also designed to provide connectivity with other MPAs and open areas at the Channel Islands through movements of adult and juvenile organisms and transport of larvae.

Published references related to effectiveness of this MPA:

Schroeter, et al. 2001

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

Schroeter, et al. 2001

Unpublished references related to use of this MPA as a research tool:

Davis, G. E. 1985; Davis, G. E. 1986; Kushner, et al. 1995a; Kushner, et al. 1995b; Kushner, D. J., et al. 1997a; Kushner, D. J., et al. 1997b; Kushner, D. J., et al. 1998; Kushner, D. J., et al. 2000; Kushner, D. J., et al. 2001; Richards, D. V. 1986; Richards, D. V. 1988; Richards, D. V. 1994; Richards, D. V., et al. 1997; Richards, D.V., et al. 1993a; Richards, D.V. and D. Kushner. 1994; Richards, D.V., et al. 1993b; Richards, D. V. 1998; Littler, M. M. (ed.) 1977; Littler, M. M. (ed.). 1978; Littler, M. M. (ed.). 1979

Department of Fish and Game

Site name: Big Sycamore Canyon State Marine Reserve*

* As of January 1, 2002, this site's designation was officially changed by the Marine Managed Areas Improvement Act from an "Ecological Reserve" to a "State Marine Reserve".

MLPA Region: South (Ventura County)

Year established: 1994

Area: 1.67 nm² **Shoreline length:** 1.84 nm

Depth range (feet): 30 to 120

Habitat types: Sandy bottom 100%

Surrounding habitat types: Mostly sandy areas. Kelp forest and reef habitat at Deer Canyon to the east. Mugu Submarine Canyon to the west.

Summary of existing regulations: No commercial or recreational take of any marine life. Fish and Game Code Secs. 1583, 1584; Title 14 Sec. 630.5(a)(b)(4).

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Big Sycamore Canyon State Marine Reserve (originally named the Big Sycamore Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources"

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers and lifeguards provide added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: Habitat mapping surveys (sonar) conducted as part of MERRP research projects.

Basic Evaluation: This site was chosen as an MPA location because it was least objectionable to users during the MRPA process. Habitat here is almost entirely sand with no reef structure. As such, this site does not contain the large diversity of species and habitats that are present in many other MPAs. Despite these limitations, it is the only MPA which provides protection to an extensive area of this type of wide spread habitat in

Department of Fish and Game

southern California. Halibut, a highly sought after species, are protected here, as well as a potential spawning area for market squid. Expansion of this site to the east would include kelp/reef habitats providing a more diverse habitat representation in the reserve.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

Cochrane, G.R., et al. 2001; Watson, W., et al. 2001

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

Cochrane, G.R., et al. 2001; Watson, W., et al. 2001

Department of Fish and Game

Site name: Abalone Cove Ecological Reserve

MLPA Region: South (Los Angeles County)

Year established: 1977

Area: 0.09 nm²

Shoreline length: 1.01 nm

Depth range (feet): 0 to 30

Habitat types: Rocky outcrops, otherwise sand in the subtidal zone. Western shoreline is rocky with sand/cobble to the east.

Surrounding habitat types: Rocky points with kelp forest and reef habitat. Sandy coves and soft bottom areas offshore.

Summary of existing regulations: No commercial take of any marine life. No recreational take of invertebrates or marine aquatic plants. Fish and Game Code Secs. 1583, 1584; Title 14 Secs. 123(f)(2)(C), 630(a)(b)(1).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose of the Abalone Cove Ecological Reserve was to allow recreational take of finfish while protecting other biological and geological resources.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local park staff may provide added enforcement presence.

Baseline and ongoing monitoring and research studies: Miller and Lawrenze-Miller included this site in black abalone surveys of the Palos Verdes Peninsula.

Basic Evaluation: Provides limited protection to selected resources in an area currently subject to disturbance from terrestrial runoff, siltation and human use. Kelp restoration efforts at this area in the 1970s provided a source of recruitment for kelp recovery over much of the Palos Verdes Peninsula as water quality and habitat conditions improved.

Department of Fish and Game

Red abalone recovered to relatively high numbers in this site during the 1980s as a result of successful natural recruitment, but declined severely by 1990 as habitat conditions deteriorated. Expansion of this area to the west would include similar habitats not as heavily affected by runoff and siltation. Controlling runoff and siltation would greatly benefit habitat conditions and allow this MPA to function more effectively in the future.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

Miller, A.C. and S.E. Lawrenz-Miller. 1993

Unpublished references related to use of this MPA as a research tool:

P.L. Haaker, et al. 1989

Department of Fish and Game

Site name: Pt. Fermin Marine Life Refuge

MLPA Region: South (Los Angeles County)

Year established: 1969

Area: 0.06 nm²

Shoreline length: 0.47 nm

Depth range (feet): 0 to 60 (estimated)

Habitat types: Complex, diverse habitats including rocky shore; kelp beds; surf grass beds; boulder and bedrock occur throughout this site.

Surrounding habitat types: Kelp forest and rocky reefs to the west and nearby offshore, soft bottom habitat to the east.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). Fish and Game Code Secs. 10500(f), 10664; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that “ Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge.” In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. A specific purpose for the Point Fermin Marine Life Refuge was to protect the rocky intertidal invertebrate and plant assemblages primarily for educational and aesthetic values.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local park staff, lifeguards and Cabrillo Aquarium staff who conduct educational and interpretive programs in the refuge may provide added enforcement presence.

Baseline and ongoing monitoring and research studies:

Rich Ambrose (UCLA) has established intertidal monitoring of intertidal plants and invertebrates. Historic algae surveys were performed in 1957-59 by E. Yale Dawson and were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom and Leslie Harris. Amanda Gerrard and Steve Murray resurveyed Dawson's transects at Point Fermin during spring 1999.

Basic Evaluation: Provides protection to most invertebrates, plants and some fishes. This is an easily accessible MPA for a large urban population and is adjacent to Cabrillo Marine Museum which conducts public education programs in the site. It would be a good site for future research and baseline monitoring. The refuge comprises diverse intertidal and subtidal assemblages and habitats that are valuable as an educational tool for the greater Los Angeles public. Area inside and outside the refuge is diverse, with kelp beds, sulfur pools and good rock habitats to the west. Because this MPA allows the take of most game species, its overall ecosystem and biodiversity maintenance functions are limited. Increasing the level of protection and modest expansion to include more of the contiguous reef system offshore and to the west would improve its effectiveness.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

Dawson, E. Y. 1959; Dawson, E. Y. 1965; Thom, R. M., and T. B. Widdowson. 1978; Widdowson, T. B. 1971; Murray, S. N., et al. 2001

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: Catalina Marine Science Center Marine Life Refuge

MLPA Region: South (Los Angeles County)

Year established: 1988

Area: 0.06 nm²

Shoreline length: 1.08 nm

Depth range (feet): 0 to 120

Habitat types: Overall this site has about 50% hard and 50% soft substrates. Southwest of the pier is a soft-bottom cove with approximately 20 moorings for large boats. Southeast is a small soft-bottom cove. Within the small cove there are approximately 8 moorings for small research craft. Further southeast are rocky walls and hard bottom (to 30 m) and deeper soft bottom (to 100 m). The hard bottom habitat supports kelp forests.

Surrounding habitat types: Rocky shoreline, kelp forest and reefs adjacent to site. Some soft bottom areas offshore and in nearby coves. Extensive reef systems in nearby general area.

Summary of existing regulations: No commercial or recreational take of any marine life. Fish and Game Code Secs. 10500, 10502.8, 10665, 10665.5; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that “ Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge.” In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. A specific purpose for the Catalina Marine Science Center Marine Life Refuge was to provide an area completely protected from take or other human disturbances for research activities associated with the adjacent marine science center.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.. Local harbor patrol, lifeguards and employees and researchers from the Marine Center provide an added enforcement presence. There are signs and buoys to mark the area as well.

Baseline and ongoing monitoring and research studies: There have been numerous studies by scientific, volunteer and student researchers. The Catalina Conservancy Divers have long-term studies, especially for giant kelp. Published and gray literature in the Southern California Academy of Sciences Bulletin. Dr.

Department of Fish and Game

Jack Engle of UCSB has conducted roving diver fish surveys during the last 3 or 4 years and is working with others to monitor rocky intertidal populations at Bird Rock. Mark Littler and Steve Murray established a site near Fisherman Cove as part of the BLM-sponsored studies in the mid-1970s. Steve Murray of CSU Fullerton has recently re-assessed the distributions and abundances of rocky intertidal populations to examine decadal scale changes in intertidal systems. Irene Tetreault has on-going fish and habitat surveys.

Basic Evaluation: Provides complete protection to all marine life in a semi-sheltered island habitat in the warm water region of the southern Channel Islands. It was established as a research site under control of the adjacent Wrigley Institute for Environmental Studies (WIES). WIES has become a popular educational and outreach center. It now subsidizes graduate student work and continues to support university researchers. The no-take MPA is vital to those operations. In addition, this site has strong research and monitoring potential to assess the effectiveness of no-take MPAs on resources since surrounding areas receive heavy recreational fishing pressure. Kelp bass and sheephead were found in higher densities and larger sizes in this MPA compared with nearby areas open to harvest indicating that this MPA is protecting these desirable species to a greater extent than general fishery regulations elsewhere. Expansion of this site, either along the shoreline or to include nearby offshore reef systems, could increase its usefulness as a research tool.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

Tetreault, I. and R.F. Ambrose. (in prep.)

Published references related to use of this MPA as a research tool:

McAlary, F.A. 1987; Murray, S. N. and M. M. Littler. 1979a; Murray, S. N. and M. M. Littler. 1979b; Murray, S. N. and M. M. Littler. 1978a; Murray, S. N. and M. M. Littler. 1978b; Murray, S. N. and M. M. Littler. 1977

Unpublished references related to use of this MPA as a research tool:

Tetreault, I. and R.F. Ambrose. (in prep.)

Department of Fish and Game

Site name: Farnsworth Bank Ecological Reserve

MLPA Region: South (Los Angeles County)

Year established: 1972

Area: 0.06 nm²

Shoreline length: N/A

Depth range (feet): 50 to 300

Habitat types: Rocky pinnacle, high relief with extensive colonies of purple hydrocoral.

Surrounding habitat types: Continuation of high relief pinnacle and reef habitat, boulder and reef debris in deeper areas with some sandy areas as well. Catalina Submarine Canyon nearby to the northwest.

Summary of existing regulations: No commercial or recreational take of purple coral. No recreational take of marine aquatic plants. Fish and Game Code Secs. 1583, 1584; Title 14 Secs. 123(f)(3); 630(a)(b)(48).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose of the Farnsworth Bank Ecological Reserve was to protect dense populations of the hydrocoral, *Allopora californica*, and high relief pinnacles.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: Area of Special Biological Significance 1981 Report by SWRCB. 1972 bathymetric and biological survey by Mary Bergen. Submarine and ROV surveys for abalone conducted by the Department.

Basic Evaluation: Provides some protection to purple coral and marine plants in a portion of a unique high relief pinnacle habitat in the warm water region of the southern Channel Islands. Has potential as a site for white abalone restoration efforts. Limiting

Department of Fish and Game

anchoring at this site to locations away from high relief pinnacles could provide added protection to the coral from anchor damage. Establishing mooring buoys has been suggested as a possible solution. Increasing the level of protection to include all invertebrates and resident fish, and modest boundary expansion to encompass the entire reef system in deeper water would significantly increase its ecosystem and biodiversity maintenance functions.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: Lover's Cove Reserve

MLPA Region: South (Los Angeles County)

Year established: 1974

Area: 0.02 nm² **Shoreline length:** 0.30 nm

Depth range (feet): 0 to 105

Habitat types: Composed of approximately 80% hard bottom. Giant kelp in shallow water.

Surrounding habitat types: Rocky and pebble shoreline adjacent to site. Sandy/soft bottom offshore.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of any marine life. Title 14 Sections. 123(f)(2)(B); 27.40.

Primary objectives: Although some harvest is officially allowed, all harvest and diving is unofficially prohibited. This small MPA adjacent to Avalon Cove is frequently used as a tourist destination for glass bottom boats, especially in the summer.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local harbor patrol, lifeguards and tour operators provide an added enforcement presence.

Baseline and ongoing monitoring and research studies: Surveyed by Dr. Milton Love's group.

Basic Evaluation: Provides de facto complete protection of all marine life. Heavily used as a tourist site for viewing relatively undisturbed and abundant nearshore reef marine life as a result of the high level of protection and observation. Kelp bass were at the same densities as areas outside this MPA but total biomass was several times greater (larger individual sizes) inside indicating that this MPA is protecting this desirable species to a greater extent than general fishery regulations elsewhere.

Published references related to effectiveness of this MPA:

Ammann, A.J., et al. 1999

Unpublished references related to effectiveness of this MPA:

Department of Fish and Game
None found

Published references related to use of this MPA as research tool:

None found

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: Newport Beach Marine Life Refuge

MLPA Region: South (Orange County)

Year established: 1968

Area: 0.02 nm²

Shoreline length: 0.61 nm

Depth range (feet): 0 to 10

Habitat types: Intertidal: sandy beach, rocky outcrop. Subtidal: patchy rock reef with sandy bottom.

Surrounding habitat types: Similar to the site. Rocky points and kelp forest reefs. Sandy areas in coves and offshore.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). Fish and Game Code Secs. 10500(f), 10664; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that “ Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge.” In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. This and several other Marine Life Refuges along the Orange County coast were established in the late 1960’s and 1970’s to primarily protect intertidal (tidepool) organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Newport Beach has a docent program to lead visitors into the refuge and educate the public on sensitivity of the resources. City lifeguards may also provide an added enforcement presence.

Baseline and ongoing monitoring and research studies: Historic algae surveys were performed in 1957-59 by E. Yale Dawson. These were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson=s transects at Little Corona del Mar during spring 1999. Mark Littler established a site at Little Corona del Mar during the 1975-79 BLM-sponsored studies of rocky intertidal

Department of Fish and Game

biota. Steve Murray of CSU Fullerton re-assessed the distributions and abundances of rocky intertidal populations at Little Corona Del Mar to examine decadal scale changes in intertidal systems.

Basic Evaluation: Provides some level of protection to invertebrates, plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use in the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

Dawson, E. Y. 1959; Dawson, E. Y. 1965; Thom, R. M., and T. B. Widdowson. 1978; Widdowson, T. B. 1971; Littler, M. M. and D. S. Littler. 1987; Murray, S. N., et al. 2001

Unpublished references related to use of this MPA as a research tool:

Littler, M. M. (ed.) 1977; Littler, M. M. (ed.). 1978; Littler, M. M. (ed.). 1979; Goodson, J. L. and S. N. Murray. (M.S. Thesis in progress)

Department of Fish and Game

Site name: Crystal Cove State Park (Overlays the Irvine Coast Marine Life Refuge)

MLPA Region: South (Orange County)

Year established: 1982

Area: 0.16 nm²

Shoreline length: 2.85 nm

Depth range (feet): 0 to 60

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent pocket sandy beaches. Most of the upper shoreline is sandy beach.

Surrounding habitat types: Similar to the site to the northwest with sandy beach and rocky points to the southeast. Sandy with scattered reefs offshore.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: To provide additional protection to marine life and habitat within the park and to inform the public about the local marine life and need for protection.

Existing Enforcement: Included as part of normal Department of Fish and Game marine

Department of Fish and Game

patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: MMS-sponsored Shoreline Monitoring Program that follows abundances of key species and documents site changes at one rocky platform in the Park; various Environmental Impact Reports have been prepared during the earlier period of park establishment and to support applications for onshore development projects. Historic algae surveys were performed in 1957-59 by E. Yale Dawson. These were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson's transects at Crystal Cove during spring 1999.

Basic Evaluation: Provides some level of protection to most invertebrates (except certain game species) and plants in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. This State Park encompasses the Irvine Coast Marine Life Refuge so the level of protection in that portion (600 feet from shore) is actually greater than provided for by State Park regulations. The adjacent onshore area is being developed for residential and commercial uses which have the potential to increase uses and impacts to the marine resources in this park. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here. The State Parks General Plan for this site recommends an Ecological Reserve with more protective regulations be established off the Pelican Point area.

Published references related to effectiveness of this MPA:

Murray, S. N. 1998; Murray, S. N., et al. 1999

Unpublished references related to effectiveness of this MPA:

Smith, J. R. 2002; Kido, J. S. 2000; Sato, L. M. 2001

Published references related to use of this MPA as a research tool:

Dawson, E. Y. 1959; Dawson, E. Y. 1965; Thom, R. M., and T. B. Widdowson. 1978; Widdowson, T. B. 1971; Murray, S. N., et al. 1999

Unpublished references related to use of this MPA as a research tool:

Smith, J. R. 2002; Kido, J. S. 2000; Sato, L. M. 2001; Sapper, S. A. 1998

Department of Fish and Game

Site name: Irvine Coast Marine Life Refuge (encompasses the inshore area of Crystal Cove State Park)

MLPA Region: South (Orange County)

Year established: 1971

Area: 0.31 nm²

Shoreline length: 2.85 nm

Depth range (feet): 0 to 60

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent pocket sandy beaches. Most of the upper shoreline is sandy beach.

Surrounding habitat types: Similar to the site.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). Fish and Game Code Secs. 10500(f), 10664; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that “ Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge.” In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. This and several other Marine Life Refuges along the Orange County coast were established in the late 1960’s and 1970’s to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park ranger, lifeguards and other staff provide an added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: MMS-sponsored Shoreline Monitoring Program that follows abundances of key species and documents site changes at one rocky platform in the Park; various Environmental Impact Reports have been prepared during the earlier period of park establishment and to support applications

Department of Fish and Game

for onshore development projects. Historic algae surveys were performed in 1957-59 by E. Yale Dawson. These were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson's transects at Crystal Cove during Fall 1998.

Basic Evaluation: Provides some level of protection for most invertebrates, plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA;

Murray, S. N. 1998; Murray, S. N., et al. 1999

Unpublished references related to effectiveness of this MPA;

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001

Published references related to use of this MPA as a research tool:

Dawson, E. Y. 1959; Dawson, E. Y. 1965; Thom, R. M., and T. B. Widdowson. 1978; Widdowson, T. B. 1971; Murray, S. N., et al. 1999

Unpublished references related to use of this MPA as a research tool:

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001; Sapper, S. A. 1998

Department of Fish and Game

Site name: Laguna Beach Marine Life Refuge

(Note: In 1993 there was inclusion of shoreline between the Laguna Beach Marine Life Refuge and the South Laguna Marine Life Refuge in the boundaries of the Laguna Beach Marine Life Refuge).

MLPA Region: South (Orange County)

Year established: 1968

Area: 0.09 nm²

Shoreline length: 0.75 nm

Depth range (feet): 0 to 60

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent pocket sandy beaches. Some of the sandy beaches of Laguna are heavily used by tourists. Most of the upper shoreline along this stretch of coastline, except for headlands, is sandy beach.

Surrounding habitat types: Similar to site. Rocky points and subtidal reefs with extensive sandy beaches and coves.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). Fish and Game Code Secs. 10500(f), 10664; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that “ Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge.” In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. This and several other Marine Life Refuges along the Orange County coast were established in the late 1960’s and 1970’s to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in refuge regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in refuge enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: MMS-sponsored Shoreline Monitoring Program that follows abundances of key species and documents site changes at two rocky platforms in the MLRS: Shaw's Cove and Treasure Island; EIS work required for onshore developments will also result in some data of scientific value on coastal populations and conditions. Historic algae surveys were performed in 1957-59 by E. Yale Dawson at a site inside Heisler Park. These surveys were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson's transects at Laguna Beach during Fall 1998.

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA;

Murray, S. N. 1998; Murray, S. N., et al. 1999

Unpublished references related to effectiveness of this MPA;

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001

Published references related to use of this MPA as a research tool:

Murray, S. N., et al. 1999

Unpublished references related to use of this MPA as a research tool:

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001; Sapper, S. A. 1998

Department of Fish and Game

Site name: Heisler Park Ecological Reserve

MLPA Region: South (Orange County)

Year established: 1973

Area: 0.04 nm²

Shoreline length: 0.39 nm

Depth range (feet): 0 to 60

Habitat types: Rocky platforms and sandy beaches. Extending out into the subtidal zone. As for most of this section of the coast, rocky benches are heavily sand influenced with rocky platforms and headlands separated by intermittent pocket sandy beaches. Main Beach in Laguna is very heavily used by tourists.

Surrounding habitat types: Similar to the site. Rocky points and benches, sandy coves with scattered offshore reefs.

Summary of existing regulations: No commercial or recreational take of any marine life. Fish and Game Code Secs. 1583, 1584; Title 14 Secs. 123(f)(2)(C); 630(a)(b)(53).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose of the Heisler Park Ecological Reserve was to completely protect from take, a portion of the local nearshore kelp forest habitat.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in refuge regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in refuge enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: Historic algae surveys were performed in 1957-59 by E. Yale Dawson at a site inside Heisler Park. These surveys were repeated in the late 1960s by T. Widdowson and in the 1970s and early 1980s by Ronald Thom. Steve Murray resurveyed Dawson's transects at Laguna Beach during Fall

Department of Fish and Game

1998. Irene Tetreault surveyed the nearshore fish populations at Heisler Park as part of a study of the effects of Ecological Reserve designations on extracted populations.

Basic Evaluation: Provides complete protection to all marine life in a southern California coastal nearshore reef habitat. The site's small size and heavy public use within the site and nearby areas appears to limit the effectiveness of protection. Despite these factors, barred sand bass and kelp bass had higher densities and larger sizes in this MPA than in areas nearby subject to harvesting pressure indicating that this site is protecting these desirable species to a greater extent than general fishery regulations alone in areas elsewhere. Combining the adjacent Laguna Beach Marine Life Refuge with this site and providing for the same higher level of resource protection would eliminate public confusion over allowable activities and simplify enforcement while providing a larger area of habitat for undisturbed ecosystem functions and biodiversity maintenance. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of MPAs:

None found

Unpublished references related to effectiveness of MPAs:

Tetreault, I. and R.F. Ambrose. (in prep.)

Published references related to use of this MPA as a research tool:

Dawson, E. Y. 1959; Dawson, E. Y. 1965; Thom, R. M., and T. B. Widdowson. 1978; Widdowson, T. B. 1971

Unpublished references related to use of this MPA as a research tool:

Tetreault I. and R.F. Ambrose. (in prep.)

Department of Fish and Game

Site name: South Laguna Beach Marine Life Refuge

MLPA Region: South (Orange County)

Year established: 1968

Area: 0.05 nm²

Shoreline length: 0.52 nm

Depth range (feet): 0 to 60

Habitat types: Substrate in this site is approximately 50% hard and 50% soft with rocky points and sandy coves, some offshore rocks.

Surrounding habitat types: Similar to the site. Rocky points, sandy beaches and coves with some offshore rocks and reefs.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). Fish and Game Code Secs. 10500(f), 10664; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. This and several other Marine Life Refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in refuge regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in refuge enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use within the site and nearby, including illegal take and incidental trampling, within the site and

Department of Fish and Game

nearby, and allowing most game species to be taken has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA;

Murray, S. N. 1998; Murray, S. N., et al. 1999

Unpublished references related to effectiveness of this MPA;

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001

Published references related to use of this MPA as a research tool:

None Found

Unpublished references related to use of this MPA as a research tool:

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001; Sapper, S. A. 1998

Department of Fish and Game

Site name: Niguel Marine Life Refuge

MLPA Region: South (Orange County)

Year established: 1971

Area: 0.41 nm² **Shoreline length:** 2.0 nm

Depth range (feet): 0 to 60

Habitat types: Substrate at this site is approximately 50% hard and 50% soft with some rocky points, offshore rocks and sandy beaches.

Surrounding habitat types: Rocky points and sandy coves to the north, major rocky headland (Dana Pt MLR) with extensive subtidal reefs to the south, Kelp forest and reef habitat and sandy areas offshore.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). Fish and Game Code Secs. 10500(f), 10664; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. This and several other Marine Life Refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in refuge regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in refuge enforcement and devote some patrol time to this area.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in a southern California coastal nearshore reef habitat. Heavy public use

Department of Fish and Game

within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA;

Murray, S. N. 1998; Murray, S. N., et al. 1999

Unpublished references related to effectiveness of this MPA;

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001

Published references related to use of this MPA as a research tool:

Dawson, E. Y. 1959; Dawson, E. Y. 1965; Thom, R. M., and T. B. Widdowson. 1978; Widdowson, T. B. 1971; Murray, S. N., et al. 1999

Unpublished references related to use of this MPA as a research tool:

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001; Sapper, S. A. 1998

Department of Fish and Game

Site name: Dana Point Marine Life Refuge

MLPA Region: South (Orange County)

Year established: 1969

Area: 0.16 nm² **Shoreline length:** 0.56 nm

Depth range (feet): 0 to 60

Habitat types: Substrate at this site is approximately 90% hard and 10% soft with extensive rocky intertidal and subtidal reefs.

Surrounding habitat types: Sandy beach with offshore kelp forest and reefs to the north. Sandy areas with scattered reefs and rock breakwater to the southeast. Kelp forest and reefs with sandy areas offshore.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). No commercial or recreational take of marine life in intertidal zone. Fish and Game Code Secs. 10500(f), 10502.6, 10667; Title 14 Sec. 123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. This and several other Marine Life Refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups. A specific purpose for the Dana Point Marine Life Refuge was the complete protection from take of the intertidal zone in 1993 to provide improved opportunities for educational and research activities associated with the adjacent Orange County Ocean Institute.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. City of Laguna Beach lifeguards are trained in refuge regulations and will issue advisories and warnings, if needed. Orange County Sheriff Deputies are trained in refuge enforcement and devote some patrol time to this area.

Department of Fish and Game

Baseline and ongoing monitoring and research studies: Orange County Marine Institute monitors transects for status of a number of intertidal organisms, and also monitors intensity of usage by visitors. Mark Littler established a site at Dana Point during the 1975-79 BLM-sponsored studies of rocky intertidal biota. Steve Murray of CSU Fullerton recently re-assessed the distributions and abundances of rocky intertidal populations at Dana Point to examine decadal scale changes in intertidal systems.

Basic Evaluation: Provides some level of protection for most invertebrates, all plants and some fishes in an extensive southern California coastal nearshore reef habitat. Complete protection of marine life in the extensive rocky intertidal zone. Site is adjacent to and supervised by the Orange County Ocean Institute which conducts public educational programs and monitoring and research efforts in the site. Such programs have provided more protection for intertidal organisms compared to other MPAs nearby. Despite these efforts, heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken in the subtidal has limited the effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA;

Murray, S. N. 1998; Murray, S. N., et al. 1999

Unpublished references related to effectiveness of this MPA;

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001

Published references related to use of this MPA as a research tool:

Murray, et al. 1999

Unpublished references related to use of this MPA as a research tool:

Smith, J. R. 2002; Kido, J. S. 2000; Sato. L. M. 2001; Sapper, S. A. 1998

Department of Fish and Game

Site name: Doheny State Beach (Overlays Doheny Marine Life Refuge)

MLPA Region: South (Orange County)

Year established: 1970

Area: 0.16 nm²

Shoreline length: N/A

Depth range (feet): 0 to 60

Habitat types: Primarily sand. At minus tides some rocks are exposed. Subtidally there are small rocks with *Egregia*. No *Macrocystis* beds. Jetty rocks on east side.

Surrounding habitat types: Rock jetty and breakwater to the northwest. Extensive sandy beach to the south. Mostly sandy offshore with a few scattered reefs.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: To provide additional protection to marine life and habitat within the state beach and to inform the public about the local marine life and need for protection.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide added on-

Department of Fish and Game
site enforcement presence.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides some level of protection for some invertebrates and all plants in a sandy beach area with a limited amount of rocky habitat. State Park provides interpretive programs and educational displays. Heavy public use within the site and nearby, including illegal take and incidental trampling, and allowing most game species to be taken has limited effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. San Juan Creek discharges into site bringing contamination from urban runoff. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: Doheny Beach Marine Life Refuge

MLPA Region: South (Orange County)

Year established: 1969

Area: 0.11 nm²

Shoreline length: 1.09 nm

Depth range (feet): 0 to 60

Habitat types: Primarily sand. At minus tides some rocks are exposed. Subtidally there are small rocks with *Egretta*. No *Macrocystis* beds. Jetty rocks on east side.

Surrounding habitat types: Rock jetty and breakwater to the northwest. Extensive sandy beach to the south. Mostly sandy offshore with a few scattered reefs.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates, except lobster. No commercial or recreational take of marine aquatic plants. No recreational take of fishes, except those specified (traditional game species). Fish and Game Code Secs. 10500(f), 10664; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes. This and several other Marine Life Refuges along the Orange County coast were established in the late 1960's and 1970's to primarily protect intertidal organisms from collecting by the general public and large educational groups.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide an added on-site enforcement presence.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: Provides a somewhat higher level of protection than the overlapping State Park for some invertebrates and all plants in a sandy beach area with a limited amount of rocky habitat. State Park provides interpretive programs and educational displays. Heavy public use within the site and nearby, including illegal take and incidental

Department of Fish and Game

trampling, and allowing most game species to be taken has limited effectiveness of protection. Enforcement presence often limited to times of highest use, while impacts incidental to visitation such as trampling are not the result of illegal activity. Even protecting all species may not be effective without added enforcement presence and increased public awareness of impacts due to visitation. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use. San Juan Creek discharges into site bringing contamination from urban runoff. Local governments (Orange County Coastal Coalition) are interested in maintaining and increasing resource protection here.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: City of Encinitas Marine Life Refuge

MLPA Region: South (San Diego County)

Year established: 1989

Area: 0.09 nm²

Shoreline length: 0.78 nm

Depth range (feet):

Habitat types: primarily soft/sand bottom

Surrounding habitat types: primarily soft/sand bottom

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates. No commercial or recreational take of marine aquatic plants. Fish and Game Code Secs. 10500(f); Title 14 Sec.123(d).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that “Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge.” In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found

Basic Evaluation: May provide some level of protection for some invertebrates and all plants in a sandy beach area with a limited amount of rocky habitat, however, present information is insufficient to provide a meaningful evaluation.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Department of Fish and Game

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: Cardiff and San Elijo State Beach

MLPA Region: South (San Diego County)

Year established: 1989

Area: 1.29 nm²

Shoreline length: 2.28 nm

Depth range (feet): 0 to 55

Habitat types: Intertidal: sandy beach, cobble beach, intertidal platform and tidepools, localized rip-rap revetment. High and low relief reefs in the subtidal zone with patchy surfgrass and small kelps beds surrounded by sand, *Macrocystis* beds about 1000 ft offshore.

Surrounding habitat types: Similar to the site.

Summary of existing regulations:

Recreational: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: abalones, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, and sea urchins. Worms may be taken except that no worms may be taken in any mussel bed, unless worms are taken incidental to the harvesting of mussels. Mussels may be taken in all areas, except in state park system reserves of natural preserves. (Title 14, Section 29.05). Marine aquatic plants may not be cut or harvested in state underwater parks. (Title 14, Section 30.00). Finfish may be taken.

Commercial: To 1,000 feet offshore, in state parks, state beaches, state recreation areas, state underwater parks, state reserves, national parks, national monuments, or national seashores: Only the following invertebrates may be taken: crabs, ghost shrimp, jackknife clams, sea urchins, squid, and worms, except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached. (Title 14, Section 123 (f)(4)). Neither state park nor underwater park designations regulate commercial kelp harvesting. Finfish may be taken.

Primary objectives: Underwater parks have no legally mandated mission but they are basically extensions of State Beaches. However, McArdle (1991) states "underwater parks are designed to preserve outstanding natural, scenic, and cultural values, indigenous aquatic and terrestrial fauna and flora, and the most significant examples of ecological regions in CA. The purpose of Cardiff and San Elijo State Beach is to make available to

Department of Fish and Game

the people, for their benefit and enjoyment forever, the scenic and recreational resources inherent to the coastal beaches and adjacent uplands of San Diego.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. State Park rangers, lifeguards and other staff provide an added on-site enforcement presence. There are seven rangers assigned to this site with one patrolling during the day and two to three at night. City lifeguards and county sheriffs may also provide some enforcement effort, if needed.

Baseline and ongoing monitoring and research studies: SANDAG 2000. EIR for beach sand replenishment has detailed habitat descriptions, plant/algae, invertebrates, fish and bird species lists ranging from 1993 to 1999, human usage reports from 1999; commercial fishery landings from 1987 to 1998, kelp maps from 1967-1992, kelp data from 1983-1999 and side-scan sonar data.

Basic Evaluation: Provides some level of protection for most invertebrates and some fishes in a southern California coastal nearshore reef/sand habitat. Actual effectiveness is limited because take of finfish and a number of invertebrate species is allowed. Increasing the level of protection within current boundaries could improve ecosystem and biodiversity maintenance functions. Expansion of site farther offshore may not be practical due to conflicts with existing commercial and recreational fisheries use.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: San Diego Marine Life Refuge

MLPA Region: South (San Diego County)

Year established: 1957

Area: 0.11 nm² **Shoreline length:** 0.54 nm

Depth range (feet): 0 to 20

Habitat types: Intertidal: Boulder field (Dike Rock area), sandy beach with exposed cobble pockets. Subtidal: sandy bottom and pier piling fouling community, submerged sandy plain with intruded lava dike, rocky reef, pier pilings

Surrounding habitat types: Similar to the site. Major rocky headland (La Jolla) with extensive kelp forest and reefs to the south. Scripps and La Jolla Submarine Canyons offshore.

Summary of existing regulations: No commercial or recreational take of invertebrates or marine aquatic plants. In the SDMLR licensees of the Regents of the University of California and all officers, employees and students of such university may take, for scientific purposes, any invertebrate or specimen of marine plant life without a permit from the Department. Fish and Game Code Secs. 10500(f), 10658; Title 14 Sec.123(f)(2)(A).

Primary objectives: Although no specific objectives were provided for the Marine Life Refuge designation, Fish and Game Code Section 10500 states that "Except under specific permit or authorization, it is unlawful: (f) To take or possess any invertebrate or specimen of marine plant life in a marine life refuge." In addition, individual Marine Life Refuges may have been established for a variety of site specific purposes.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. Local lifeguards may provide an added enforcement presence. Local residents and businesses frequently observe the area and report suspicious activities. Despite this level of awareness, poaching frequently occurs here and a number of citations are written each year.

Baseline and ongoing monitoring and research studies: Davis, N. and G. Van Blaricom 1978. Re-sampled sandy bottom transects that were sampled by Fager from 1957 - 1963 off of La Jolla Pier. Fager EW 1968. Engle, J et al 1998; 1999; in press. US Navy publications. Paul Dayton starting a study there. Ron McCaunneghy from Scripps has been monitoring changes in the reserve.

Basic Evaluation: Provides complete protection for invertebrates and marine plants. Site provides an opportunity for collection and research by Scripps Institution of Oceanography personnel. Allowed take of fishes may limit this site's ecosystem protection value, but could provide an opportunity to examine effects of such regulations. Combining this site with the adjacent San Diego-La Jolla Ecological Reserve and providing for the same higher level of resource protection would eliminate public confusion over allowable activities and simplify enforcement while providing a larger area of habitat for undisturbed ecosystem functions and biodiversity maintenance.

Published references related to effectiveness of this MPA:

None found

Unpublished references related to effectiveness of this MPA:

None found

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

None found

Department of Fish and Game

Site name: San Diego-La Jolla Ecological Reserve

MLPA Region: South (San Diego County)

Year established: 1971

Area: 0.58 nm² **Shoreline length:** 1.41 nm

Depth range (feet): 0 to 280

Habitat types: Rocky reefs and outcrops surrounded by sand. Surfgrass, kelp forest. Children's Beach has become a harbor seal haul out site.

Surrounding habitat types: Similar to the site. Sandy and pebbly beaches to the north. Scripps and La Jolla Submarine Canyons offshore.

Summary of existing regulations: No commercial take of marine life, except squid for bait using hand-held scoop nets. No recreational take of marine life. Fish and Game Code Secs. 1583, 1584; Title 14 Secs. 123(f)(2)(C); 630(a)(b)(96).

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. A specific purpose for the San Diego-La Jolla Ecological Reserve was to provide an area of nearshore habitat protected from take for activities research associated with the adjacent Scripps Institute of Oceanography.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. This is a popular, well enforced MPA with a variety of important habitat types, although lobster poaching is suspected to occur at night. Local lifeguards may provide an added enforcement presence.

Baseline and ongoing monitoring and research studies: Numerous studies by Scripps Institute of Oceanography, especially by Drs. Paul Dayton and Mia Tegner.

Basic Evaluation: Provides nearly complete protection for all marine life (except for

Department of Fish and Game

limited take of squid) and an opportunity for research and public enjoyment of undisturbed marine communities. Kelp bass and sheephead were found in higher densities and larger sizes in this MPA than in nearby areas open to harvest indicating that this MPA is protecting these desirable species to a greater extent than general fishery regulations elsewhere. Combining the adjacent San Diego Marine Life Refuge with this site and providing for the same higher level of resource protection would eliminate public confusion over allowable activities and simplify enforcement while providing a larger area of habitat for undisturbed ecosystem functions and biodiversity maintenance.

Published references related to effectiveness of MPAs:

None found

Unpublished references related to effectiveness of MPAs:

Tetreault, I. and R.F. Ambrose. (in prep.)

Published references related to use of this MPA as a research tool:

None found

Unpublished references related to use of this MPA as a research tool:

Tetreault, I. and R.F. Ambrose. (in prep.)

Department of Fish and Game

Site name: Point Loma Reserve

MLPA Region: South (San Diego County)

Year established: 1978

Area: 0.01 nm²

Shoreline length: 0.54 nm

Depth range (feet): 0 to 6 (intertidal)

Habitat types: Intertidal: northern part of the reserve has narrow exposed shelves with boulder/cobble overlying the pavement reef. The southern part has wider (60-100 m), flatter reefs with fewer high-relief outcrops, boulders and surge channels than the northern part of the reserve. Subtidal: mostly rocky (extension of intertidal) with surfgrass and patches of small kelps (mostly *Egregia*).

Surrounding Habitat types: Extensive rocky shoreline and kelp forest reefs to the north. San Diego Bay entrance with scattered reefs and sandy areas. Extensive kelp forest reefs offshore.

Summary of existing regulations: No commercial take of invertebrates, except lobster and crab. No recreational take of invertebrates and marine aquatic plants. Title 14 Secs. 27.50; 123(f)(2)(B).

Primary objectives: To protect intertidal and shallow subtidal marine populations within the Cabrillo National Monument.

Existing Enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area. National Park service rangers and other staff provide and added on-site enforcement presence resulting in a closely policed area which appears to be effective in protecting resources from take.

Baseline and ongoing monitoring and research studies:

Engle and Davis Navy, USGS, USMMS) have ongoing intertidal resources monitoring efforts since 1990. Zedler characterized intertidal resources in 1976 and documented public use and its effects in 1978.

Basic Evaluation: Provides protection to most invertebrates and plants in the intertidal zone. Cabrillo National Monument provides public interpretive and educational programs and information on marine life in the Reserve. Reserve appears to be effective as populations of many species, especially invertebrates such as limpets, snails and

Department of Fish and Game

barnacles, and algae such as rockweed that are subject to harvesting and trampling pressure, are higher than in nearby areas open to take and unsupervised visitation. Expanding this MPA to the larger boundaries of the surrounding Cabrillo National Monument and providing the same level of increased resource protection as the Reserve would eliminate public confusion over allowable activities and simplify enforcement while providing a larger area of habitat for undisturbed ecosystem functions and biodiversity maintenance

Published references related to effectiveness of this MPA:

Davis, G.E and J.M. Engle. 1991. Ecological condition and public use of the Cabrillo National Monument intertidal zone in 1991. Cooperative National Park Resources Studies Unit, University of California, Institute of Ecology. U.S. Geological Survey open-file report 00-61 4006962101.

Engle, J.M. and G.E. Davis, 2000. Ecological condition and public use of the Cabrillo National Monument intertidal zone 1990-1995. U.S. Department of Interior, U.S. Geological Survey open-file report 00-98.

Unpublished references related to effectiveness of this MPA:

Zedler, J.B. 1976. Ecological resources inventory of the Cabrillo National Monument intertidal zone. U.S. Department of Interior, National Park Service project report.

Zedler, J.B. 1978. Public use effects in the Cabrillo National Monument intertidal zone. U.S. Department of Interior, National Park Service project report.

Published references related to use of this MPA as a research tool:

Engle, J.M. and G.E. Davis. 2000. Baseline surveys of rocky intertidal ecological resources at Point Loma, San Diego. U.S. Department of Interior, U.S. Geological Survey, Denver, CO.

Engle, J.E. and G.E. Davis. 2000. Rocky intertidal resources monitoring handbook, Cabrillo National Monument, Point Loma, San Diego, California. U.S. Department of Interior, U.S. Geological Survey, Denver, CO. U.S. Geological Survey open-file report 00-202.

Unpublished references related to use of this MPA as a research tool:

Bal, J. 1999. Growth, survival, reproduction and demography of the chiton, *Stenoplax conspicua*. San Diego State University. Masters Thesis.

Eichelberger, R.D. and C.A. Alexander. 2001. Cabrillo National Monument tidepool survey. San Diego State University class project report.

Shaver, R.D. 1980. Community structure and disturbance of the under rock habitat in the

Department of Fish and Game

Cabrillo National Monument intertidal zone. San Diego State University. Masters Thesis.

South Region Estuarine Areas

Site name: Goleta Slough Ecological Reserve

MLPA Region: South (Santa Barbara County)

Year established: 1981

Area: 0.51 nm² **Shoreline length:** not available

Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat

Surrounding habitat types: Coastal lowlands and bluffs, coastal beaches and urban development.

Summary of existing regulations: Recreational fishing in ecological reserves is generally restricted by method of take. Fishing in Goleta Slough Ecological Reserve is only allowed from designated areas. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(51)(C) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references:
None found.

Department of Fish and Game

Site name: Bolsa Chica Ecological Reserve

MLPA Region: South (Orange County)

Year established: 1973

Area: 0.64 nm² **Shoreline length:** 19.57 nm

Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, coastal beaches and urban development.

Summary of existing regulations: Recreational fishing in ecological reserves is generally restricted by method of take. Fishing in Bolsa Chica Ecological Reserve is allowed only from designated areas. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(16)(B) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references;
None found.

Department of Fish and Game

Site name: Upper Newport Bay Ecological Reserve

MLPA Region: South (Orange County)

Year established: 1975

Area: 0.64 nm² **Shoreline length:** 12.39 nm

Depth range (feet): not available

Habitat types: Estuarine bay with tidal channels, mud flats and salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, and urban development.

Summary of existing regulations: Recreational fishing in ecological reserves is generally restricted by method of take. Fishing in Upper Newport Bay Ecological Reserve is permitted from boats and shore. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(113)(A) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references:

None found.

Department of Fish and Game

Site name: Buena Vista Lagoon Ecological Reserve

MLPA Region: South (San Diego County)

Year established: 1969

Area: 0.27 nm² **Shoreline length:** 23.01 nm

Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, and urban development.

Summary of existing regulations: Recreational fishing in ecological reserves is generally restricted by method of take. Fishing in Buena Vista Lagoon Ecological Reserve is allowed until 12 midnight. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(18)(B) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references:

None found.

Department of Fish and Game

Site name: Batiquitos Lagoon Ecological Reserve

MLPA Region: South (San Diego County)

Year established: 1978

Area: 0.25 nm² **Shoreline length:** 2.67 nm

Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, coastal beaches and urban development.

Summary of existing regulations: Recreational fishing in ecological reserves is generally restricted by method of take. Fishing in Batiquitos Lagoon Ecological Reserve is limited to angling from shore. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a)(2), 630(b)(10) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references:
None found.

Department of Fish and Game

Site name: San Dieguito Lagoon Ecological Reserve

MLPA Region: South (San Diego County)

Year established: 1988

Area: 0.12 nm² **Shoreline length:** 1.43 nm

Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Coastal lowlands and bluffs, and urban development.

Summary of existing regulations: Recreational fishing in ecological reserves is generally restricted by method of take. Fishing in San Dieguito Lagoon Ecological Reserve is permitted from shore and the Grand Avenue Bridge. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a), 630(b)(97)(A) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references:

None found.

Department of Fish and Game

Site name: San Elijo Lagoon Ecological Reserve

MLPA Region: South (San Diego County)

Year established: 1977

Area: 1.04 nm² **Shoreline length:** 4.74 nm

Depth range (feet): not available

Habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Surrounding habitat types: Estuarine tidal lagoon and channels with salt marsh habitat.

Summary of existing regulations: Recreational fishing in ecological reserves is generally restricted by method of take. Fishing in San Elijo Ecological Reserve is limited to angling from shore. No person shall take fish for commercial purposes in any ecological reserve except by permit from the commission. (Title 14, Sections 630(a)(2), 630(b)(98) CCR)

Primary objectives: Although no specific objectives were provided for the Ecological Reserve designation, Fish and Game Code Section 1580 under Article 4. Ecological Reserves states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to Ecological Reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: Included as part of normal Department of Fish and Game marine patrol activities for this general area based on available patrol resources and level of fishery activity in the area.

Baseline and ongoing monitoring and research studies: None found.

Basic Evaluation: Insufficient information for evaluation at this time.

Published and unpublished references:

None found.

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